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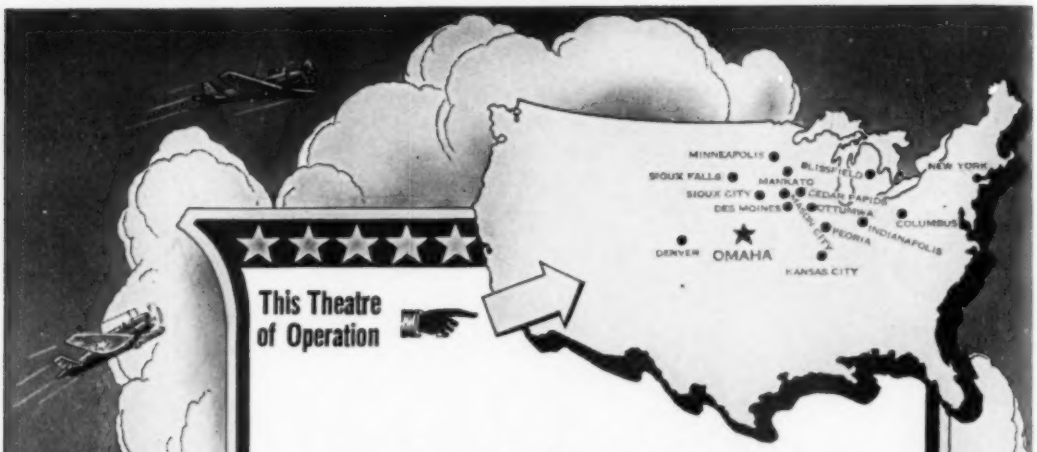

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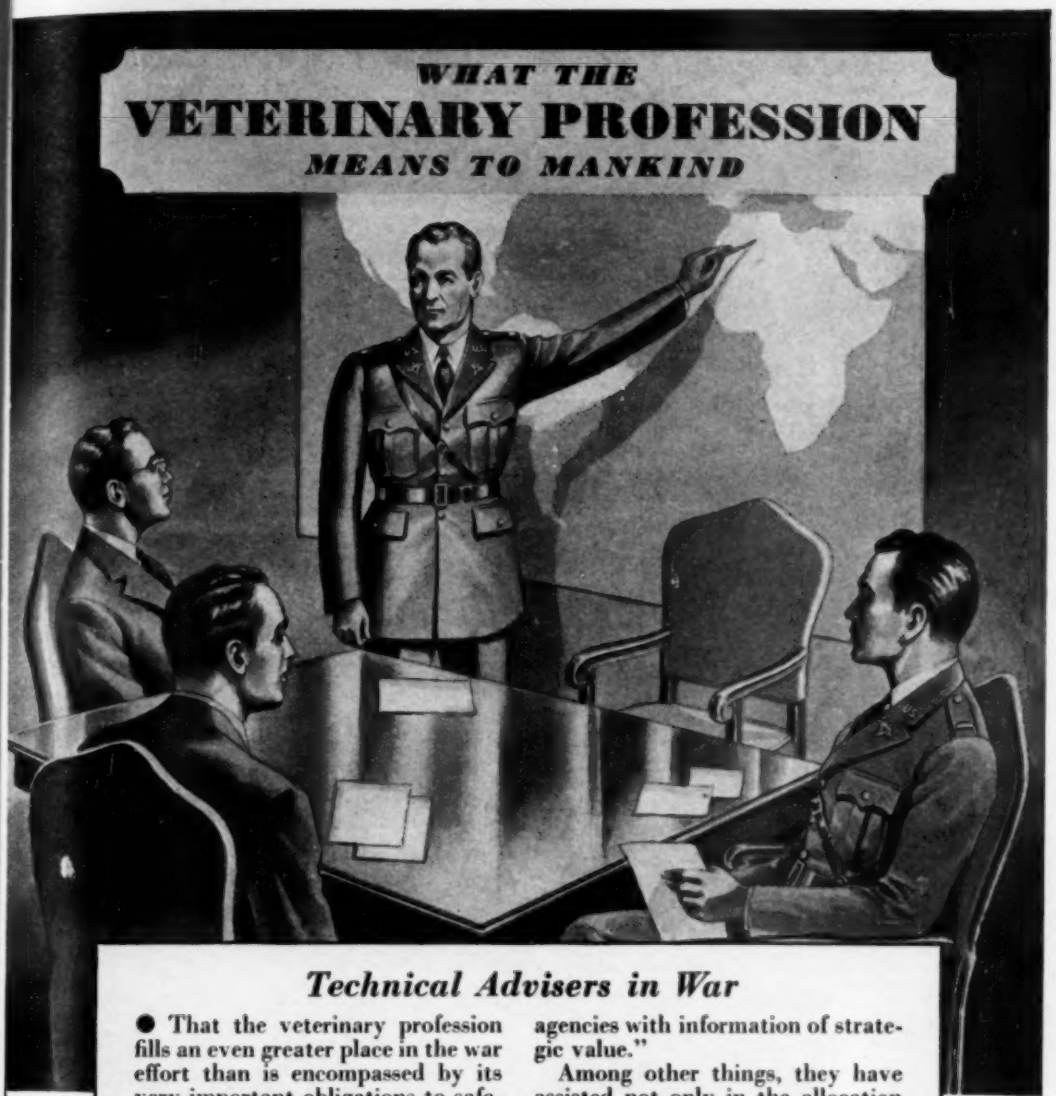

Technical Advisers in War

● That the veterinary profession fills an even greater place in the war effort than is encompassed by its very important obligations to safeguard America's food producing animals and the food for our fighting forces, is made clear by a statement of the chief of the Bureau of Animal Industry:

"Almost daily, veterinary officials in key positions furnish the War Production Board, the Army, the Tariff Commission and other Federal agencies with information of strategic value."

Among other things, they have assisted not only in the allocation of crude supplies and finished products, but in the allotment of precious shipping space for vital materials entering or leaving our ports.

This re-emphasizes the fact that in its trained veterinary personnel America has a vast fund of specialized knowledge not duplicated by the resources of any other group.

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VOL. CII MARCH, 1943 NO. 792

Threat To Livestock Disease Control

Speech of the Hon. George W. Gillie of Indiana, delivered before the House of Representatives, Feb. 1, 1943 in behalf of the effort to retain the Division of Meat Inspection under the direction of the chief of the Bureau of Animal Industry.

MR. SPEAKER, on January 27 my esteemed colleague the gentleman from Minnesota [MR. H. CARL ANDERSEN] sounded a timely warning on the dangers from the foreign livestock malady, foot-and-mouth disease. His remarks were clear, concise, and convincing, but they dealt only with what might be termed predictable avenues through which this disease, and other foreign diseases of comparable seriousness, may menace our livestock industry.

With a world at war we must not only envision the usual or predictable means by which our livestock may fall victim to this disease but in addition what may be termed the unpredictable means such as the willful and malicious activities of saboteurs.

Our enemy countries as well as other European and Asiatic countries are now suffering the most severe scourge of this disease in history. Obviously, our best precautions may, during wartime, be circumvented. Therefore, our vigilance against its introduction is not enough. There must be no weakness in our preparedness plan to cope with the disease should it make its appearance within our borders.

There were five separate invasions of foot-and-mouth disease in the United States during the first 29 years of the present century. Each outbreak was of foreign origin and was vigorously combatted and promptly eradicated. The two most destructive outbreaks occurred in 1914-16, involving the livestock to a greater or lesser degree of 22 states, and in 1924-25, when two states—one very seriously—were involved.

Throughout the five campaigns against this costly plague, the responsibility for its control and eradication was vested in the Bureau of Animal Industry for the Federal Government, and the comparable veterinary organizations of the affected states. No state has ever shirked its responsibility during such times, but in most cases state veterinary forces have been limited, and it became necessary for the Federal Government to provide the major veterinary personnel.

Foot-and-mouth disease is an acute, rapidly spreading, infectious disease and its successful extermination calls for a large, well-trained, and mobile veterinary force. The United States Bureau of Animal Industry has kept constantly in readiness a program and personnel roster for immediate action whenever necessary.

The Bureau is the largest single employer of veterinarians in the world. In normal times they are employed in regular assignments, in various divisions of the Bureau, but in case of emergency they are quickly mobilized for such essential special duty.

The Bureau has each time been successful in quickly placing in the field to combat foot-and-mouth disease a large force

of veterinarians experienced in the diagnosis, control, and disposition of infected animals.

Mr. Speaker, we have spent large sums of money from private and public sources to eradicate and control animal disease in this country and now have the cleanest livestock in the world. We are literally holding in trust for the rest of the world the best blood lines now existent for the reëstablishment of herds and flocks in other countries when the war is over.

With this in mind, I have been very seriously concerned over reports that the Bureau of Animal Industry is to be broken up under plans for a reorganization of the Department of Agriculture. Acting under authority of an executive order issued on December 5, 1942, the Secretary of Agriculture is now entertaining a proposal to detach permanently the Meat Inspection Division of the Bureau of Animal Industry and place it in the Food Distribution Administration.

Such a move would reduce by about 900 the number of trained veterinarians now available to the Bureau to combat such diseases as foot-and-mouth disease.

My remarks should not be construed as minimizing the importance of the food distribution program, but I am greatly concerned when from any source or through any pretext, action is contemplated which tends to deplete the only organization that is competent to furnish the protection required by our livestock industry against the threat of such a devastating malady as foot-and-mouth disease.

Any benefit that might be furnished to the Food Distribution Administration by such a move would sink into insignificance when compared to the loss that would unavoidably be sustained should we suffer an outbreak of foot-and-mouth disease.

Mr. Speaker, under leave to extend my remarks, I wish to place in the *Record* at this point a letter* directed to the Secretary of Agriculture by the American Veterinary Medical Association, urging that the Bureau of Animal Industry be maintained as an intact working organization, with all its forces under the unified direction of a veterinarian as chief.

*This letter is published in the "News" section of this issue.

Organized Veterinary Medicine in Iowa

The 1943 meeting of the Iowa Veterinary Medical Association was a notable session—a standing room only type of meeting of which there are but few. Nowhere are the fruits of good organization more abundant than in Iowa, which maintains not only the best patronized state organization but also 13 all-Iowa local societies of the lively, well-supported sort. The fruits are outwardly expressed in its college of veterinary medicine, in the field of scientific research, in its spirit of coöperation on national livestock sanitary problems, in the social rating of its veterinarians and their prosperity, and in the pattern molded for others to use in building up a better and bigger veterinary service for the American people.

Located in the center of food production, Iowa veterinarians have reasons to be as proud of their wartime efforts as the country is pleased to profit by them.

Farm Product Defined

The term *agricultural commodity*, or *farm product* is defined in General Orders of the Office of War Transportation as

"Any article or thing which is yielded, or raised, or produced on a farm—either incidentally to or as a result of cultivation of the soil or in connection with the breeding of livestock—by nature, labor, or otherwise. Such terms include any domestic animal, bird, or insect raised on a farm, and also any product of such animal, bird, or insect produced thereon or in connection with the operation of a farm and used as food, as fertilizer, or for the manufacture of clothing."

All of which goes to show that the carpet of soil spread over the earth has finally been discovered as the place to go for things to eat. It took a global, all-out war and shrinking girths to put the idea over, but the prosaic peasantry will be no less glad to learn that their occupation is useful.

Evidence of Transmission of Inapparent (Subclinical) Form of Equine Infectious Anemia by Mosquitoes (Psorophora Columbiae), and by Injection of the Virus in Extremely High Dilution

C. D. STEIN, V.M.D., J. C. LOTZE, Ph.D., and L. O. MOTT, D.V.M.
Washington, D. C.

IN A RECENT paper, "Transmission of Equine Infectious Anemia by the Stablefly, Stomoxys Calcitrans, the Horsefly, Tabanus Sulcifrons (Macquart), and by Injection of Minute Amounts of Virus,"[1] the authors reviewed the literature on transmission of infectious anemia by arthropods, including the mosquito, and presented conclusive evidence to indicate that mechanical transmission may be easily accomplished through the bites of either horseflies or stable flies and by the injection of very small amounts of virus.

In view of the above findings and inasmuch as mosquitoes are proved vectors of such filtrable virus diseases as yellow fever, equine encephalomyelitis, and fowl pox, it appeared probable that arthropods may also play a part in the mechanical transmission of equine infectious anemia.

In this paper, which deals with a continuation of our studies on this aspect of the disease, the results obtained in experiments carried out for the purpose of determining whether the disease could be mechanically transmitted either by mosquitoes or by the virus in high dilution are reported.

MATERIAL AND METHODS

The strain of virus used in the experiments was identical with that used in the positive transmission experiments with horseflies and stable flies. This strain was originally isolated from field cases of infectious anemia in Wyoming and was highly virulent.

The host animal from which the mosquitoes received their infective feed was the same source animal used in the horsefly transmission experiments reported previously. This animal suffered from an acute attack of the disease which was produced experimentally by intravenous injection of the virus.

The susceptible horses used in these experiments weighed from 900 to 1,200 lb. They were held under observation in screened isolation stables having concrete floors and screened vestibules. As far as can be determined, none of the experimental horses had any previous contact with horses affected with infectious anemia. Temperatures of all test animals were taken and recorded at least twice daily. Special precautions were taken to exclude all possibilities of accidental transmission during the course of experiments.

The mosquitoes used in the experiments were cultured from larvae collected in temporary pools of rain water at the Beltsville Research Center. The larvae, after being transported to the laboratory, were washed with tap water and were placed in glass jars containing tap water to which very small amounts of compressed yeast and rolled oats were added. The jars were then covered with cheesecloth. The adult female mosquitoes were removed daily from the jars and were placed in cages covered with cheesecloth. Raisins soaked in tap water were placed in the cages as a source of food for the mosquitoes until they were used in the transmission attempt.

The mosquito-transmission experiment was conducted in a screened isolation stable, and due precautions were taken to prevent accidental transmission of the disease through direct contact of infected and susceptible horses and through unknown vectors or contaminated materials. The experimental horse was placed in an insect-free screened enclosure in which the infected source horse had been previously placed. The two animals were tied a sufficient distance apart to prevent actual contact with each other. At the conclusion of the transmis-

This investigation was a coöperative project of the Pathological and Zoölogical Divisions of the Bureau of Animal Industry, United States Department of Agriculture, from July, 1941, to March, 1942, at the Animal Disease Station, Beltsville Research Center, Beltsville, Maryland.

[1]Stein, C. D., Lotze, J. C., and Mott, L. O.: Transmission of Equine Infectious Anemia by the Stable fly, Stomoxys Calcitrans, the Horsefly, Tabanus Sulcifrons (Macquart), and by Injection of Minute Amounts of Virus. Am. J. Vet. Research, 3, (1942): 183-193.

TABLE 1.—Infectious Anemia Transmission Tests with Mosq

		Transmission Test (Original Exposure)			Passage of Virus Follo			
					First Passage			
	Principal Test Horse	Material Administered	Date 1941	Results	Normal Horse	Material Inoculated	Date 1941	Results
Experiment 1	1277*	Inoculated subcutaneously with 1 cc. of 1 to 100,000 dilution of filtered serum H 1297	July 3	No clinical symptoms of infectious anemia developed in 97 days	1288	100 cc. of whole blood drawn from 1277 (10–8–41) before second exposure test	Nov. 18	Developed clinical symptoms of infectious anemia in 21 days
Experiment 2	1300	Exposed to the bites of 186 mosquitoes that had previously partially fed on acute case 1246	July 15	No clinical symptoms of infectious anemia developed in 86 days	1170	100 cc. of whole blood drawn from 1300 (10–8–41) after mosquito exposure but before second exposure test	Nov. 18	Failed to develop clinical symptoms in 123 days

*Blood sample collected from horse 1277 on July 3, 1941, before exposure to the virus in 1 to horse (1334). The susceptibility of horse 1334 to infectious anemia was subsequently confirmed

TABLE 2.—Showing Correlation Between Insect Transmission and Mechanical Tit

			Insect Transmission			
			Results			
Type of Insect	Horse No.	Number of Bites	Incubation Period	Type of Disease	No. Reactions	No. Days Until Death After Exposure
Horse flies	1320	60	10 days	Acute	4	52
	1295	20	11 days	Subacute	11	Alive
Stable flies	1270	233	24 days	Acute	4	63
Mosquitoes	1300	186	No reaction for 85 days	Inapparent (subclinical)*	0	Alive

sion attempt, the experimental horse was thoroughly sprayed with a fly repellent and immediately removed to a separate screened isolation pen in which it was held under observation during the entire test period.

The procedure followed in conducting the transmission attempt with the mosquito, *Psorophora columbiae*, was as follows: Approximately 20 adult female mosquitoes were transferred to each of 20 one-half pint glass fruit jars covered with a fine mesh curtain material. The hair was clipped from a small region on the back of the respective infected and experimental horses. Each glass jar containing the mosquitoes was then held with the curtain material in contact with the clipped area. The mosquitoes were first allowed to feed on the infected horse for only a relatively short time. As soon as it was observed that certain of the mosquitoes would soon be fully engorged, each jar of mosquitoes was immediately transferred to the back of the experimental horse. The mosquitoes were allowed to feed on the experimental horse until all or nearly all of them refused to feed. In recording the number of mosquitoes most likely to be concerned with the transmission of the disease, only those known to have been feeding on the infected horse were counted. On the basis of the mosquitoes known to have fed on the experimental horse and from

uitoes and by Injection of the Virus in 1 to 100,000 Dilution

WING ORIGINAL EXPOSURE				SECOND EXPOSURE TEST ON PRINCIPALS				
SECOND PASSAGE								
NORMAL HORSE	MATERIAL INOCULATED	DATE 1942	RESULTS	HORSE NO.	MATERIAL ADMINISTERED	DATE 1941	RESULTS	CONCLUSIONS
	None made			1277 after first exposure to virus in 1 to 100,000 dilution	10 cc. subcutaneous of W. filtered virus H 1320	Oct. 9	No reaction for 165 days	Tests indicate that an inapparent (subclinical) but carrier form of infectious anemia was transmitted to 1277 by inoculation of the virus in 1 to 100,000 dilution
1331	250 cc. whole blood drawn from 1170 (1-13-42)	Jan. 13	First reaction on third day developed clinical symptoms of infectious anemia	1300 86 days after exposure to mosquito bites	10 cc. subcutaneous of W. filtered virus H 1320	Oct. 9	Aside from a temperature of 101.2 F. on 10-21-41 (twelfth day), no definite clinical symptoms developed for 165 days	Tests indicate that an inapparent (subclinical) but carrier form of the disease was transmitted to 1300 by the bites of infected mosquitoes
				1266 normal control	10 cc. subcutaneous of W. filtered virus H 1320	Oct. 9	Clinical symptoms developed on 10-19-41 (tenth day). Died 11-15-41, after 3 febrile reactions (Acute fatal case)	Indicates that exposure virus 1320 used to test susceptibility of inapparent cases 1277 and 1300 was fully virulent

100,000 dilution failed to produce symptoms of infectious anemia when injected into a normal by exposure to a known strain of virus.

ration Transmission Experiments with Virus Obtained from a Common Source

TITRATION TRANSMISSION						
			RESULTS			
TITRATION DILUTION	HORSE NO.	AMOUNT METHOD	INCUBATION PERIOD	TYPE OF DISEASE	NO. OF REACTIONS	NO. DAYS UNTIL DEATH AFTER EXPOSURE
Undiluted	1289	1 cc. subcutaneous	11 days	Acute	1	30
1 to 10	1268	1 cc. subcutaneous	12 days	Acute	1	26
1 to 1,000	1274	1 cc. subcutaneous	25 days	Acute	2	51
1 to 100,000	1277	1 cc. subcutaneous	No reaction for 97 days	Inapparent (subclinical)†	0	Alive

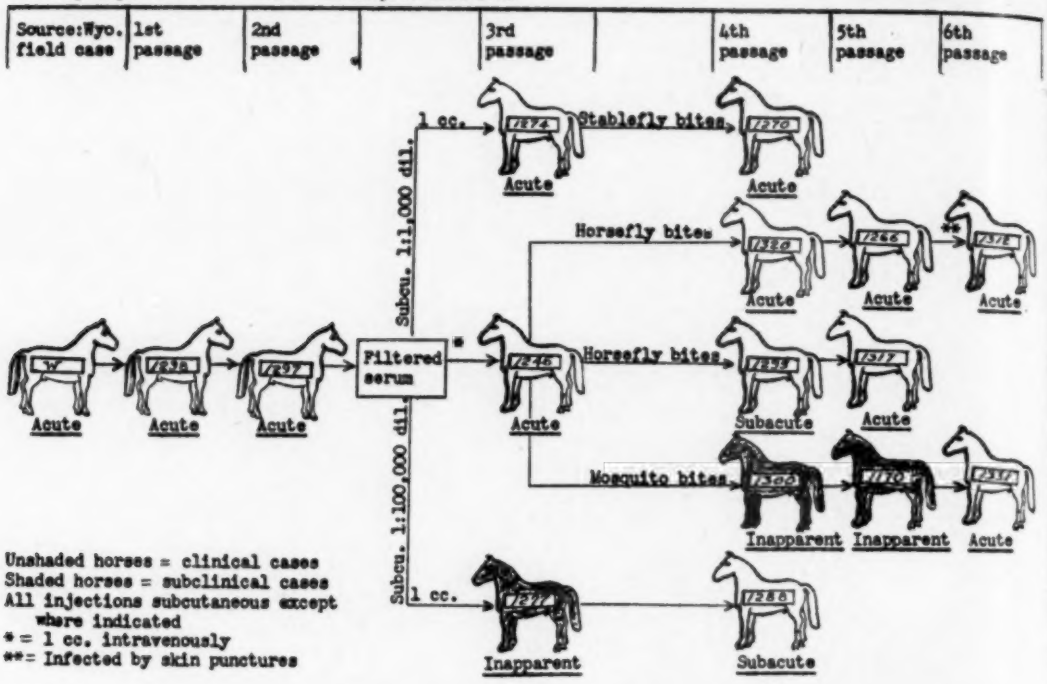
*Immunity conferred; virus recovered on second passage. †Immunity conferred; virus recovered on first passage.

the observations made in preliminary tests, it appeared reasonably certain that the mosquitoes that were interrupted in their feedings on the infected horse resumed feeding when transferred to the experimental horse.

PROTOCOLS OF EXPERIMENTS

Table 1 shows transmission tests with mosquitoes and of the virus in 1 to 100,000 dilution. This table also shows transmission of the disease from subclinical cases to normal horses, as well as tests to determine the susceptibility of subclinical cases. Table 2 shows the correlation between transmission with mosquitoes and other insects,[1] and titration transmission by injection. Plate 1 shows the passage of the virus from its source through horses by injection and with mosquito bites compared with passage by injection and with horsefly and stable fly bites. Graph 1 gives a temperature record of horse 1288, infected by one passage of virus from the subclinical case (1277) induced by injection of the virus in 1 to 100,000 dilution. Graph 2 gives a temperature record of horse 1331, infected by the second passage of virus from the

Plate 1. Transmission of infectious anemia from a common source by mosquito bites and by injection of the virus in 1:100,000 dilution compared with transmission by bites of horseflies and stable flies and by injection of the virus in 1:1,000 dilution.



subclinical case (1300) induced by the bites of infected mosquitoes. The following protocols give further information on the tabulated data.

Experiment 1.—On July 3, 1941, a normal horse (1277), was inoculated subcutaneously with 1 cc. of 1 to 100,000 dilution of virulent filtered serum H 1297 drawn June 10, 1941, and diluted in physiological saline, a sample of which had produced an acute case in a susceptible horse in 1 cc. dose of 1 to 1,000 dilution. Horse 1277 was held under observation until Oct. 9, 1941, a period of ninety-seven days, but failed to show any clinical reaction indicative of infectious anemia.

On Oct. 9, 1941, horse 1277 was inoculated subcutaneously with 10 cc. of virulent, filtered, undiluted virus H 1320 (drawn Aug. 4, 1941); a normal control horse (1266) received at this time the same strain and amount of virus. No clinical reactions occurred in horse 1277 for 165 days, but control horse 1266 developed symptoms of acute infectious anemia in ten days.

These results indicated that horse 1277 was either a subclinical carrier case before being used in the experiment, or that he had developed an inactive form of the disease in which immunity had been established by the injection of the virus in 1 to 100,000 dilution.

Blood from horse 1277, drawn prior to the time he was first used on the experiment, when injected into a normal control horse (1334), caused no clinical reactions for 149 days, indicating that horse 1277 was free of virus at the time he was first inoculated. The susceptibility of horse 1334 to infectious anemia was subsequently confirmed by exposure to a strain of virus of known virulence. However, blood drawn from horse 1277 on Oct. 8, 1941, ninety-seven days after inoculation with the virus in 1 to 100,000 dilution, and before receiving the second undiluted exposure virus, when injected into normal horse 1288, produced clinical symptoms of infectious anemia in twenty-one days. This reaction was followed by five additional intermittent febrile attacks (graph 1). These results definitely indicate the establishment of an

inapparent carrier case of infectious anemia in horse 1277 by the inoculation of the virus in 1 to 100,000 dilution (tables 1 and 2, and plate 1).

Experiment 2.—On July 15, 1941, 186 mosquitoes (*Ps. columbiae*) were partially engorged by interrupted hand feeding on infected source horse 1246 and were immediately transferred to normal horse 1300 where they were permitted to feed to repletion. Following the transmission attempts, experimental horse 1300 was sprayed with fly repellent and immediately moved to a screened isolation stable and held under observation until Oct. 9, 1941, or eighty-six days. No clinical reaction indicative of infectious anemia resulted.

On Oct. 9, 1941, horse 1300 was inoculated subcutaneously with 10 cc. of filtered virulent H 1320 virus drawn Aug. 4, 1941. A normal control horse (1266) received the same virus in the same amount on this date. Aside from a slight rise in temperature, (101.2 F. on the twelfth day), no clinical symptoms of infectious anemia developed in horse 1300 for 165 days, but the normal control horse 1266 developed symptoms af acute infectious anemia in ten days. These results seemed to indicate that horse 1300, like horse 1277 (experiment 1) was a subclinical case and further suggested that an inapparent case and immunity had been produced in horse 1300 by the bites of the infected mosquitoes.

In view of the results obtained in experiment 1, it also appeared likely that horse 1300, as a result of the bites of infected mosquitoes, might be a carrier of the virus.

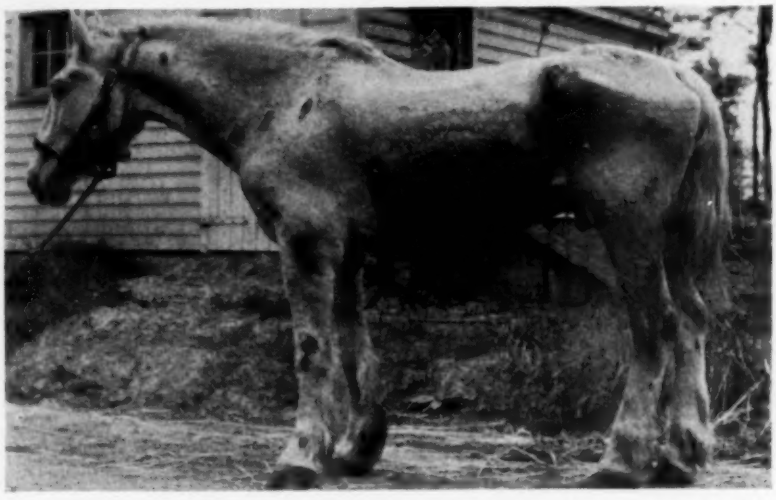


Fig. 1.—Subacute case of infectious anemia, horse 1331 (a short time prior to becoming moribund). Loss of weight, 450 lb. Progressive anemia. Red cell count, 3 and ½ million. Red cell volume, 0.20. Infected by second passage of virus from subclinical case 1300, induced by mosquito bites.

Therefore, on Nov. 18, 1941, 100 cc. of whole blood that had been collected on Oct. 8, 1941, from horse 1300 after exposure to infected mosquito bites, but before the second exposure to known virus, was injected into normal horse 1170. Aside from a slight temperature reaction (100.4 F.) and slight sluggishness on Jan. 10, 1942 (fifty-three days after being injected), horse 1170 showed no clinical reactions of infectious anemia for 123 days. However, when 250 cc. of blood collected from horse 1170 on the fifty-sixth day was inoculated into normal horse 1331 on Jan. 13, 1942, symptoms of acute infectious anemia appeared on the third day (fig. 1 and graph 2). These subinoculation tests on the blood of horse 1300 indicated that two successive passages of the virus from this mosquito-transmitted subclinical case were sufficient

to produce a typical acute clinical case in a normal horse, and seemed to indicate without doubt that horse 1300 was an inapparent carrier. In the first passage from horse 1300 to horse 1170, it was also evident that the disease had been transmitted in an inapparent carrier form to the latter animal (tables 1 and 2, and plate 1).

DISCUSSION

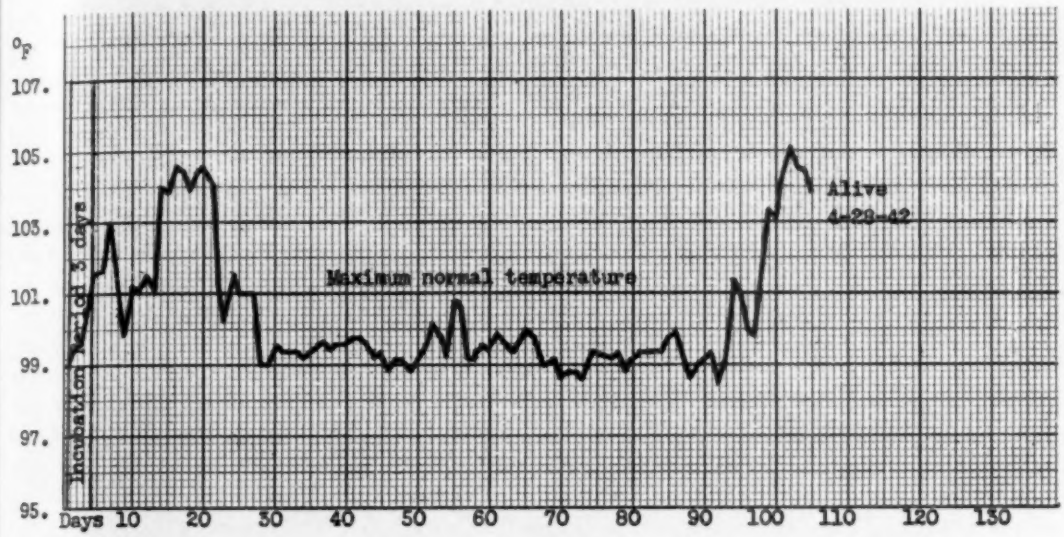
In the experiments herein described, evidence was obtained to indicate that an inapparent carrier form of infectious anemia may be transmitted from an infected to a susceptible horse by the bites of mosquitoes (*Ps. columbiae*). It was also demonstrated that the subcutaneous inoculation of the virus in 1 to 100,000 dilution was sufficient to set up a subclinical but carrier type of the disease in susceptible horses.

This is the first investigation of this nature, so far as we know, in which it has been definitely demonstrated that a subclinical carrier form of the disease can be produced in susceptible animals by the bites of infected insects or by injections of the virus in extremely high dilution. On the basis of the results obtained, it appears likely that the transmission of inapparent forms of the disease occurs principally when extremely small amounts of virus are introduced beneath the skin surface, either by the bites of insects or through the use of contaminated bleeding or hypodermic needles, or by other means. It has been shown that one or two passages of the virus in large doses from suspected inapparent carriers to susceptible horses may set up a typical acute clinical form of the disease. These findings suggest the possibility that in the transmission and dissemination of other filtrable virus diseases of both man and animals, the type and course of the resulting disease is in some way modified by the amount of infective material which the host receives.

Graph 1.—Temperature record of infectious anemia horse 1288. Infectivity test on virus from inapparent case 1277 that was induced by a 1 to 100,000 dilution dosage (experiment 1).

From a comparison of the results obtained by the authors[1] in previous work with the stable fly and the horsefly (*Tabanus sulcifrons*), and those obtained by the injection of virus in extremely high dilution, as shown in table 2 and plate 1, there appeared to be a close correlation in the type of infection transmitted by injection of the virus in certain titrations with that induced by the different kinds of insects used. It also seemed apparent that the mosquito, *Ps. columbiae*, is not able to transmit the virus in large quantities. What effect, if any, the insect secretions may have had on the virus is not known, but in this connection it is of interest to note that, as in the case of the experiment involving the

stable fly, blood frequently oozed from skin punctures made by the mosquitoes. Reference is made to the work of Gordon and Lumsden[2] for a description of the feeding method of a closely related mosquito, *Aedes aëgypti*.



Graph 2.—Temperature record of infectious anemia horse 1331. Infectivity test on virus following two passages in inapparent cases, first induced in mosquito-exposed horse 1300 (experiment 2).

SUMMARY

The results obtained in the present investigations suggest the danger which may arise from making blood transfusions or horse-serum injections in treating any equine disease when the source animal is an unknown, inapparent case of infectious anemia. The importance of controlling the flying-insect pests of horses and of using sterile hypodermic and bleeding needles on horses and mules, especially in affected areas, is stressed.

Evidence is reported to indicate that infectious anemia in an inapparent (subclinical) form can be induced in a susceptible horse by the subcutaneous inoculation of 1 cc. of virus in 1 to 100,000 dilution. Mosquito transmission of one positive case (subclinical) by Psorophora mosquitoes is also reported.

Evidence is presented to show that the active form of the disease may be transmitted to susceptible horses by the injection of blood from subclinical cases.

[2]Gordon, R. M., and Lumsden, W. H. R.: A Study of the Behavior of the Mouth-Parts of Mosquitoes when Taking up Blood from Living Tissue, Together with some Observations on the Ingestion of Microfilariae. Annals of Trop. Med. and Parasitol., 33, (1939): 259-278.

The annual meeting of the American College of Physicians scheduled for Philadelphia, Apr. 13-16, 1943 was cancelled by its Board of Regents. Among the well-known reasons given for the cancellation, the difficulty of maintaining the usual standards of program was pointed out.

The Holstein-Friesian Association of America, as a result of a sanction given to the directors last year, will not hold a 1943 meeting. Officers and directors elected in 1942 will continue in office until successors have been elected.

In view of the food situation throughout the world, the American and Canadian surpluses may play an important part in the outcome of the war.

How is your war-stamp book? Schickelgruber's ration book allows the vanquished Frenchman one hen's egg per month.

The Effect of Varying Doses of a Commercial Phenothiazine Upon Lambs

WM. D. McNALLY, A.B., M.D.
Chicago, Illinois

THE VALUE of phenothiazine as an anthelmintic in swine and sheep has been investigated by various workers, such as Harwood, Habermann and Jerstad,[1] Swales,[2] Gordon and Whitten,[3] Gordon,[4] Swanson, Harwood, and Connelly,[5] and Roberts.[6] Swanson, Porter, and Connelly[7] reported they found phenothiazine to be comparatively nontoxic for calves, and believed it to be of value as an anthelmintic for gastrointestinal nematodes in these host animals.

In the investigation, rats, rabbits, dogs, horses, and lambs were used. In our preliminary work, a therapeutic dose of 50 Gm. of "phenoboles" (manufactured by American Chemical Company, Chicago) was given to 42 healthy horses, in collaboration with T. B. Crowe, a Chicago veterinarian. The single dose caused no untoward symptoms. The urine of four of the experimental animals was examined for the presence of blood and was found to be negative.

One hundred hogs were given one bolus (17 Gm.) each, and compared with a similar number not given any boluses. Those given the preparation gained in weight and appeared to be in better condition than the control animals.

Two dogs given one bolus a day developed an anemia within two weeks. White rats given daily doses of "phenoboles" became definitely ill and began to lose their hair. This depilatory action was due to an agent contained in the commercial preparation, and not to phenothiazine. This latter preparation was also toxic to rabbits, a report of which will be given in another paper.

This research was financed by a grant from the American Chemical Company. The preliminary work was done for the purpose of its future therapeutic use as an anthelmintic for children.

Associate Professor of Medicine, Department of Toxicology, Rush Medical College.

Fifteen lambs were used in our experiment, 11 beginning March 23, and 4 May 3, 1941. The entire experiment with these animals was terminated July 1, 1941. Lambs 1, 2, 3, 4, 5, 6, 7, and 8 were given the preparation "phenobole" in the order mentioned below, while lambs 9, 10, and 11 were used as controls. Lamb 1 received one bolus every two weeks, 2 and 3 a bolus once a week, 4 and 5 one bolus twice a week, 6 and 7 one bolus three times a week, and lamb 8 one bolus each day as long as the animal could stand it. In table 1, the weights of the animals are recorded, showing a steady increase in all except lamb 8 which had been given one bolus each day. The general condition of this latter lamb became very poor and on May 17 the treatment was stopped. Shortly afterward it began to gain in weight rapidly enough to equal the weight of the first three animals within a few weeks.

Beginning May 3, 1941, the four lambs 12, 13, 14, and 15 were given boluses containing 12.5 Gm. of phenothiazine in the following order: one every two weeks, one once a week, one twice a week, and one three times a week. When the experiment was begun, the lambs weighed approximately 60 lb. each. They gained in weight steadily each week during the following two months. Blood counts were made weekly. In addition to those made weekly, blood counts had also been made one week preceding the administration and two weeks after cessation of the drug for comparison of the blood cells—before and after administration—making the animals "controls" in so far as blood counts were concerned. The result of the blood study showed a tendency to polycythemia, in the more frequent dosage, and a predisposition to an agranulocytosis in those receiving one bolus or more a week. The high red cell count, I believe, was due

to a sulfhemoglobinemia and a subsequent physiological red blood cell increase. The result of the blood counts made on these four lambs is given in table 2.

Lambs 4, 7, 8, 9, 12, 13, 14, and 15 were sacrificed for autopsies. The autopsy findings on lamb 4 were as follows: Bled to death without anesthesia, autopsy immediately after death. Date: May 29, 1941.

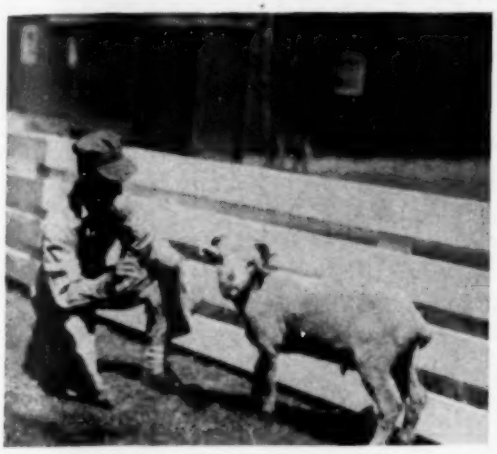


Fig. 1.—A worm-stunted animal.

9:30 a. m. It was a well-developed male sheep weighing 87 lb. There was a moderate amount of serous discharge from the nose, but the external examination revealed nothing remarkable. The fat of the midline was 15 mm. thick in the thorax and 10 mm. thick in the abdomen. The viscera of the abdomen and thorax were in their usual relationships, and there was no excess of fluid in any of the serous cavities. Numerous large lymph nodes, up to 2 cm. in diameter, were found in the lesser omentum and around the abdominal aorta.

The thymus was small and was represented by a mass of fat. The right lung weighed 210 Gm. It was pink, soft, and everywhere crepitant. The vessels at the hilus showed no change, and the bronchial linings were smooth and without excessive secretion. The cut surface was pink, soft, and a small amount of blood could be squeezed from its surface. The left lung weighed 148 Gm. It resembled the right in all respects. The heart weighed 173 Gm. Its surface was smooth, and there was a small amount of epicardial fat. The muscle was pink-red and firm. The right chambers were not dilated, the endocardium was transparent, and the valves were smooth and thin. The left chambers were not dilated, the valves were smooth. There were diffuse petechial hemorrhages beneath the endocardium of the middle two-thirds of the left ventricle. The aorta was of usual thickness. The lining was smooth and white, and the vessel was quite elastic. At the upper margins of the aortic sinuses of Valsalva was a small amount of black pigment in indiscrete patches, the largest of which was 2 by 12 mm. in greatest diameters. The spleen weighed 51 Gm. The capsule was gray and wrinkled. Through the capsule could be seen many millimeter-sized white spots, present all over the surface. The cut surface was deep red; the corpuscles were few and indistinct. The trabeculae stood out as a white network. The liver weighed 734 Gm. It was deep blue-red, and the capsule was

Fig. 2.—Thrifty, treated animals.

transparent. There were 7 or 8 areas from 3 to 7 mm. in greatest diameter seen on the surface, which were white and blended into the liver tissue. Section through these areas revealed that they extended diffusely down into the liver tissue for a depth of 3 to 6 mm. The liver was cut with the usual ease, revealing a deep-red surface. The lobules were indistinctly made out. White areas resembling those described in the foregoing were seen, here and there, deep in the liver tissue. The gall bladder

contained 25 cc. of thin green bile. The wall was thin and translucent, and the lining velvety. Extrahepatic bile ducts were patent. The pancreas weighed 32 Gm. The color was tan-white and the cut surface revealed the usual lobulated appearance. The stomach contained a large amount of undigested foodstuff, quite filling the rumen. Just distal to the cardiac orifice of the rumen, in the lesser curvature, was a small papillomatous projection 2 mm. in diameter. The lining of the other three chambers showed no change. The intestinal tract was opened through its entire length, and no changes were observed. The kidneys together weighed 132 Gm. The surfaces were deep red-blue, smooth, and without lobulation. The capsules stripped with ease, leaving a smooth surface. On cut surface, the right kidney had a tan-red cortex in which the striations were distinct. The cortex measured 10 mm. in thickness. The medulla was pale red, 15 mm. wide, and the rays were quite distinct. The pelvis was white and smooth. The cut surface of the left kidney revealed a cortex like that of the right. The medulla was 10 mm. wide, and the rays were seen with ease. The pelvis was white and its lining smooth; there were a few areas up to 3 mm. in diameter where the pelvic mucosa was thickened. In the pelvis and calyces, there were numerous brownish-black amorphous masses, gritty to the touch. These were from pin-point to 8 mm. in diameter. The ureters were not dilated, and their linings were smooth. The bladder was empty, and its lining smooth. There was a small amount of black pigment in the mucosa of the trigonal region. The adrenals together weighed 3 Gm. The cortex of each was pale red and measured 2 mm. in width; the medulla of each was white and measured up to 8 mm. in width. The testicles together weighed 80 Gm. Each was of generous size, and very firm. A homogenous grayish-white surface appeared on sectioning, around the periphery of which there was a layer of greenish-brown pigment, extending into the testicular substance for a distance of 1 to 2 mm. The tubules had only a slight tendency to "string." Careful examination of the contents of the entire gastrointestinal tract showed them to be free of all macroscopic parasites.

TABLE I.—Variations in Weight of Lambs Fed Phenoboles*, with Time of Treatment

TIME IN DAYS	VARIATIONS IN WEIGHT (LB.)										
	TREATED†							CONTROL			
	LAMB NO.							LAMB NO.			
	1	2	3	4	5	6	7	8	9	10	11
1	44	52	50	71.5	68	58.5	49	64.5	67.5	72	48.5
7	46	52	52.5	74	69	52.5	41.5	62.5	67.5	76	51.5
14	49	57.5	57	81	70	60.5	53	69.5	70.5	78.5	46
21	51	57.5	58	82	76	61	48	66.5	71.5	81	45.5
28	52.5	56.5	54	86	73	63	45.5	59.5	71.5	73.5	47
35	54	55.5	54	89.5	75.5	66	51.5	62.5	79.5	77.5	53
42	54	53.5	51	90.5	72	67	49.5	64	76	82.5	60
49	56	55.5	56	90	70	68.5	52.5	60.5	79	80	62.5
56	57	57.5	58.5	87.5	69	67.5	52.5	58	84	68.5	58.5
63	58.5	58	62.5	88	71	65.5	51.5	59	85	66	62
70	61	60	62.5	87	71	66	54	68	90	67.5	62
79	63.5	62	65.5		72.5	66.5			87.5	69	62.5
86	66	71	67		74	67.5			92	71.5	65
93	67	69.5	67		72.5	65.5			94.5	73.5	69
100	67	70	67		76	71			95	72.5	66.5

This experiment was carried out from Mar. 23, 1941, to July 1, 1941.

*Phenobole = a bolus containing 12.5 Gm. of phenothiazine.

†Lamb 1 received 1 bolus biweekly; 2 and 3, 1 bolus weekly; 4 and 5, 1 bolus two times weekly; 6 and 7, 1 bolus three times weekly; and 8, 1 bolus daily until sickened. Lambs 9, 10, and 11 served as controls.

Lamb 7 weighed 55 lb. and appeared healthy. The autopsy June 5, 1941, revealed no abnormalities in the thoracic and abdominal cavities. On cross section, the lungs, liver, heart, spleen, pancreas, and intestine appeared normal. An examination of the bowel and stomach failed grossly to reveal any evidence of parasites. Cross section of the kidney revealed an edematous condition of the cortex; the capsule was removed easily.

On microscopic examination, the kidney showed scattered areas of increased amounts of fibrous tissue in the cortex. Collections of round cells were noted in these areas, and at the periphery of the areas, there were some dilated tubules. An occasional glomular tuft was adherent to its respective capsule. Some of the tufts were vacuolated and contained some pink-staining material in the capsular spaces. No evidence of acute inflammation was found in the glomeruli. Occasional convoluted tubules were dilated. The tubular epithelium of both convoluted tubules and loops

of Henle showed varying degrees of swelling and granularity, and the nuclei of both were vacuolated. The lumens of most of them contained granular pink-staining material. Other tubules in the cortex contained red blood cells and nuclear débris. No changes were noted in the vessels. The myocardium showed no significant changes. The lungs had masses of lymphocytes in some of the peribronchiolar tissue. No other significant changes were noted. The edematous and the pelvis contained several small purplish-brown concretions, 2 by 3 mm. in diameter. The capsule was removed with difficulty. On section, the lung showed hemorrhages in several areas.

On microscopic examination, the intestine presented no significant changes. The spleen had many large macrophages filled with brown pigment. No other significant changes were seen. The myocardium was normal. The lung had many fresh blood-

TABLE 2.—Blood Examination of Lambs Fed Phenoboles*

	Lamb 12†								Lamb 13†						
Date Remarks	W.B.C.‡	R.B.C.	% Hb.	P.	L.	M.	E.	B.	W.B.C.	R.B.C.	% Hb.	P.	L.	M.	E.	B.
4/26/41 Before Drug Administration (Control)	5,000	4.1	70	50	40	7	2	1	4,500	4.7	85	28	64	5	2	0
5/3/41	5,800	8.97	60	29	65	1	5	0	6,500	8.3	65	24	74	2	0	0
5/10/41	7,200	4.25	70	47	45	6	1	1	6,600	5.6	75	37	54	6	3	0
5/17/41	8,200	8.80	50	25	73	1	2	0	11,000	5.9	65	41	54	2	3	0
6/7/41	6,800	6.10	80	19	79	1	1	0	6,800	5.5	70	20	73	3	0	4
6/15/41	5,900	5.95	80	19	80	1	0	0	5,100	5.23	100	23	70	7	0	0
6/30/41 Ended drug administration	5,000	6.1	100	15	70	10	2	3	8,100	6.00	100	20	65	13	2	0
7/16/41 (Control)	5,200	4.75	75	18	75	7	0	0	8,000	5.9	100	15	70	14	0	1

* Phenobole = a bolus containing 12.5 Gm. of phenothiazine.
† Lamb 12 received 1 bolus every 2 weeks; Lamb 13, 1 bolus each week.
‡ W.B.C. = white blood cells; R.B.C. = red blood cells; % Hb = per cent hemoglobin; P = polymorphonuclear leucocytes; L = lymphocytes; M = mononuclear leucocytes; E = eosinophiles; B = basophiles.

liver cells were swollen and granular, particularly about the portal areas. No areas of vacuolation or of necrosis were detected.

Lamb 8. This lamb was given one bolus every day until May 18 when the dosing was discontinued because its condition became bad; it had difficulty in walking, refused to eat, and remained away from the other lambs. From May 18 to June 5, the lamb gained 12 lb. The autopsy June 5, 1941, failed to show anything of significance in the spleen, heart and bowel. There were no parasites in the stomach or bowels. On section, the liver was found soft and light yellow. The kidneys were filled alveoli. No other significant changes were noted. The liver cells were generally swollen and granular, and certain areas appeared hydropic. There were no areas of focal necrosis. In the kidney there was a marked increase in interstitial connective tissue throughout the entire section, but mostly in the cortical portions (scarring). These areas contained numerous round cell collections and dilated tubules. Many of the glomeruli in these areas were atrophic. Others showed increased epithelial cells and the tufts were adherent to the capsules. Some of the dilated tubules contained granular, pink-staining material. Others con-

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21	51	57.5	58	82	76	61	48	66.5	71.5	81	45.5
28	52.5	56.5	54	86	73	63	45.5	59.5	71.5	73.5	47
35	54	55.5	54	89.5	75.5	66	51.5	62.5	79.5	77.5	53
42	54	53.5	51	90.5	72	67	49.5	64	76	82.5	60
49	56	55.5	56	90	70	68.5	52.5	60.5	79	80	62.5
56	57	57.5	58.5	87.5	69	67.5	52.5	58	84	68.5	58.5
63	58.5	58	62.5	88	71	65.5	51.5	59	85	66	62
70	61	60	62.5	87	71	66	54	68	90	67.5	62
79	63.5	62	65.5		72.5	66.5			87.5	69	62.5
86	66	71	67		74	67.5			92	71.5	65
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5/10/41	7,200	4.25	70	47	45	6	1	1	6,600	5.6	75	37	54	6	3	0
5/17/41	8,200	8.80	50	25	73	1	2	0	11,000	5.9	65	41	54	2	3	0
6/7/41	6,800	6.10	80	19	79	1	1	0	6,800	5.5	70	20	73	3	0	4
6/15/41	5,900	5.95	80	19	80	1	0	0	5,100	5.23	100	23	70	7	0	0
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tained hyaline or orange-staining material. The tubular epithelium everywhere was swollen, granular, and in many tubules desquamated. The tubular lumens were filled with granular débris. The arteriolar walls of those in the scarred areas were thickened, the lumens narrowed.

Lamb 9 was a control animal. The autopsy June 5, 1941, revealed no changes in the heart, spleen, lungs, liver, stomach, or intestine. Microscopically, there were convoluted tubules were dilated. The tubular epithelium of both convoluted tubules and loops of Henle showed varying degrees of swelling and granularity and the nuclei of many were vacuolated. The lumens of most of them contained granular pink-staining material. Other tubules contained hyaline light pink or orange-red material. One tubule in the cortex contained red blood cells and nuclear débris. No changes were seen in the vessels. The myocardium showed

TABLE 3.—Blood Examination of Lambs Fed Phenoboles*

		Lamb 14†							Lamb 15†						
Date	Remarks	W.B.C.‡	R.B.C.	% Hb.	P.	L.	M.	E.	B.	W.B.C.	R.B.C.	% Hb.	P.	L.	M.	E.	B.
4/26/41	Before Drug Administration (Control)	4,200	4.80	85	15	79	5	1	0	4,500	4.75	60	38	52	6	4	0
5/3/41		6,100	8.75	75	12	73	12	2	1	6,200	9.0	75	20	71	6	3	0
5/10/41		6,300	8.65	75	12	85	3	0	0	5,600	7.0	60	28	63	7	2	0
5/17/41		4,800	5.25	85	38	59	7	1	0	6,300	8.15	85	30	64	3	3	0
6/7/41		4,200	7.1	75	23	75	1	0	1	4,300	9.2	90	19	69	8	0	4
6/15/41		4,800	6.54	100	20	70	9	1	0	5,100	7.25	100	25	60	12	0	3
6/30/41	Ended Drug Administration	5,200	7.15	100	12	75	10	2	1	4,800	6.3	85	15	70	10	3	2
7/16/41	(Control)	4,250	5.1	100	14	77	8	0	1	4,500	5.1	85	11	80	9	0	1

* Phenobole = a bolus containing 12.5 Gm. of phenothiazine.
† Lamb 14 received 1 bolus 2 times a week; Lamb 15, 1 bolus 3 times a week.
‡ W.B.C. = white blood cells; R.B.C. = red blood cells; % Hb = per cent hemoglobin; P = polymorphonuclear leucocytes; L = lymphocytes; M = mononuclear leucocytes; E = eosinophiles; B = basophiles.

no changes found in the heart, lungs, liver, spleen, pancreas, or intestine.

Lamb 12 weighed 91 lb. at completion of the experiment. The autopsy July 25, 1941, failed to show anything of significance in the heart, lungs, liver, spleen, pancreas and kidneys, and intestine.

On microscopic examination, the kidney showed scattered areas of increased amounts of fibrous tissue in the cortex, collections of round cells in these areas and at the periphery of the areas, and some dilated tubules. An occasional glomerular tuft was adherent to its respective capsule. Some tufts were vacuolated and contained some pink-staining material in the capsular spaces. No evidence of acute inflammation was found in the glomeruli, but occasional no significant changes. In the lung, there were masses of lymphocytes in some of the peribronchiolar tissue. No other significant changes were noted. The liver cells were swollen and granular, particularly about the portal areas. There were no areas of vacuolation or of necrosis in the liver, nor significant microscopic changes in the spleen, pancreas, or intestine.

Lamb 13 received one bolus a week. It weighed 87.5 lb. at completion of experiment, a gain of 27.5 lb. since the experiment was begun, and it appeared to be well nourished and active. The wool on its hind legs was stained a yellow-brown. The autopsy July 25, 1941, upon exposure of the thoracic and abdominal cavities, revealed that the lungs were pink, soft, and crepi-

tant throughout. The cut surface showed no lesions. The heart muscle was pink-red and firm, and there were no petechial hemorrhages beneath the endocardium. Grossly, the spleen was normal in appearance. The liver was dark red and the capsule transparent, but grossly, there were no changes. The pancreas was tan-white and did not show any changes. The gastrointestinal tract, grossly, failed to show any abnormalities.

On microscopic study, sections of the lungs showed the alveoli to be empty; there was no enlargement of the vessels. The muscle fibers of the heart were of the usual size. The spleen showed moderately enlarged splenic corpuscles in an unchanged pulp. The liver had the usual lobulated appearance, but without increase of connective tissue. The liver cells appeared in cords and had their usual foamy cytoplasm and large clear nuclei. The kidneys contained a small amount of albuminous material in some of the tubules. The glomeruli and tubules were swollen.

Lamb 14 weighed 81 lb. The wool on the hind legs was stained yellow-brown. The autopsy July 25, 1941, revealed nothing of significance on gross examination of the lungs, heart, liver, spleen, pancreas, kidneys, and intestine. Microscopically, the lungs showed hemorrhagic areas throughout. The kidneys showed cloudy swelling of tubules, hemorrhagic areas, swollen glomeruli, and interstitial nephritis. There were no changes found in the heart, liver, and pancreas.

Lamb 15 weighed 69 lb. at completion of experiment. This lamb was fed one bolus three times a week. The autopsy July 25, 1941, showed no gross changes in the heart, lungs, and spleen. The liver was purplish-red, with occasional white areas, 2 by 5 mm. in their greatest diameter, which blended into the liver tissue. The pancreas, stomach, and bowel were normal. The kidneys were smooth without lobulation; capsules stripped easily. On cut surface, both kidneys were soft, and of light tan color. In the pelvis and the calyces, there were purple-black, hard, gritty concretions, which were granular up to 5 mm. in diameter. Examination of the gastrointestinal tract showed it to be free of macroscopic parasites.

Microscopic examination of the heart tissue, spleen, pancreas, and bowel showed nothing significant. In the lung, there were some hemorrhagic areas showing the presence of red blood cells in the alveoli. Both kidneys showed swelling of the tubules and hemorrhagic areas throughout. The glomeruli were swollen and a hemorrhage was present.

CONCLUSION

From the foregoing experiment, it has been found that phenothiazine can be given safely to lambs several times during the year without ill effect, but when given oftener than once in two weeks for months at a time, it will cause pathological changes in the kidneys. The result of the blood study shows a tendency to a polycythemia in the more frequent dosage and a predisposition to an agranulocytosis in those receiving one bolus or more a week.

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As vital to victory as gun, ships, and tanks, is food. Our men in Bataan and Corregidor were conquered by hunger and exhaustion (and exhaustion was largely the result of hunger) rather than by the bullets and bayonets of Japs. Undernourishment is as dangerous to America's cause as lack of fighting equipment.—*From Food for Freedom, Armour and Company, Chicago.*

Studies on Baby Pig Mortality
III. A Note on Experimental Insulin Hypoglycemia in the Pig

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MAGEE AND HARVEY[1] have shown that injections of insulin have the same effect on the blood sugar of the pig as that of other animals. They observed convulsions at a relatively high sugar level and concluded that the pig is apparently more sensitive to hypoglycemia than either man or the usual laboratory animals. These authors also observed that injections of glucose hastened the recovery of pigs from insulin hypoglycemia. The experimental observations (Magee and coworker) are of special interest, inasmuch as Graham, Sampson, and Hester[2] reported the occurrence of acute spontaneous hypoglycemia in entire litters of newborn pigs affected with so-called "baby pig disease," which sometimes responds to treatment with glucose, especially if repeated, intraperitoneal injections are given during the early stage of the syndrome. Sampson, Hester, and Graham[3] found that newborn pigs are highly susceptible to the development of an intense fatal hypoglycemia when fasted. Such experimental hypoglycemia also responds favorably to glucose therapy if treatment is begun early. Magee and Harvey[1] did not report the effect of prolonged hypoglycemia in their experiments. The purpose of this report is to record some observations on insulin hypoglycemia in young pigs, with special reference to the deleterious effects of prolonged hypoglycemia and the response to delayed injections of glucose.

Deleterious Effects of Prolonged Hypoglycemia in Laboratory Animals and in Man.—Sherrill and MacKay[4] have investigated the deleterious effects of prolonged insulin hypoglycemia in rats and dogs. The following statements appear in the summary of their report, "Overdosage with protamine zinc insulin produced the characteristic coma and convulsions in the rat. If the duration of the insulin shock was not short, the administration of dextrose in amounts sufficient to raise the blood-sugar level to a normal value was without influence. Death from respiratory failure always ensued, and there was usually marked edema of the lungs. . . . Hypoglycemia is known to affect the metabolism of the brain in an adverse manner and to give rise to degenerative changes. We found evidence that prolonged hypoglycemia [in dogs] led to permanent functional damage to the brain. After long periods of hypoglycemia due to the administration of protamine zinc insulin over a period of three to five days, permanent sensory and motor disturbances ensued. The dogs had impairment or complete lack of vision or hearing, disturbances of the emotional complex, incoördination, spasticity and even paralysis."

Coincident with the growing popularity of insulin shock treatment for mental derangements in man, first reported by Sakel,[5] an increasing number of papers has been published emphasizing the dangers which may be associated with this form of therapy. Excellent discussions of the sub-

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[1]Magee, H. E., and Harvey, D.: The Effect of Insulin on the Blood Sugar of the Pig. J. Physiol., lxiv (1927), Proc. pp. 31-32.

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ject have been presented by Baker[6] and by Wortis and Lambert.[7] These investigators on nervous diseases of man point out that so-called irreversible or hyperglycemic coma is apparently a relatively common and dangerous complication of insulin treatment in schizophrenia and occasionally also in diabetes. The irreversible or hyperglycemic effect is characterized by the failure of some patients in protracted insulin coma, metabolism (by withdrawal or substrate) below levels adequate for cell maintenance over long periods." Wortis and Korr[8] found that if brain metabolism is maintained above this dangerous level during prolonged insulin coma, by means of carefully controlled intravenous injections of 5 per cent glucose in physiological saline, there is much less likelihood of cerebral injury and establishment of irreversible coma.

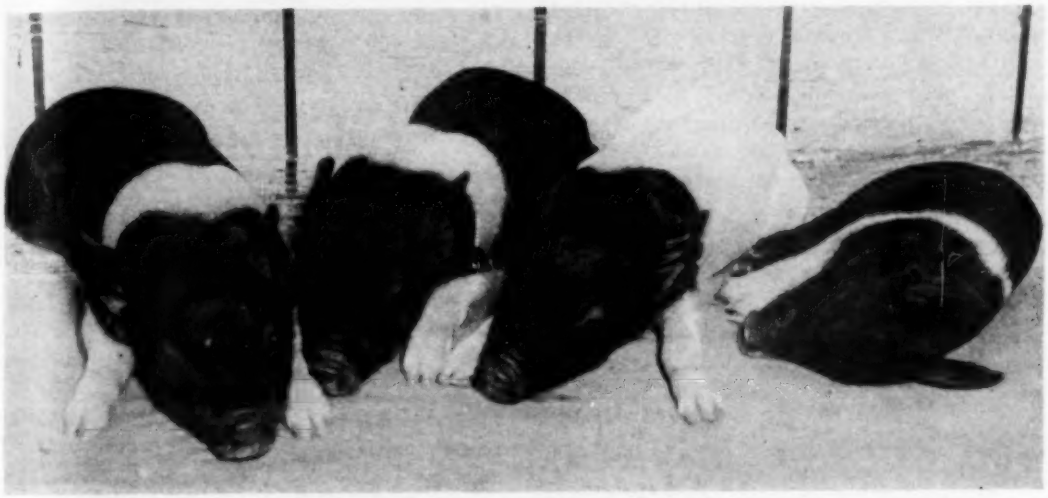

Fig. 1.—Experimental Insulin Coma

Permanent functional damage of the brain and so-called irreversible coma as well as sudden death may ensue if pigs are maintained in a state of comatose hypoglycemia for approximately four or more hours. Injections of glucose hasten recovery from hypoglycemia of short duration, but may have little value in overcoming the effects of prolonged hypoglycemia.

more than an hour or an hour and a half, to react favorably to the administration of glucose, even after the sugar solution is given intravenously and the blood sugar raised to and maintained above the normal range. This unfavorable and sometimes fatal outcome is believed to be due to injury of the brain from severe hypoglycemia. According to Wortis and Korr,[8] "It can be assumed that the cerebral injury which ensues in accidentally protracted coma is due to the diminution of brain

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EXPERIMENTAL INSULIN HYPOGLYCEMIA

Ordinary insulin (Lilly) was used for all experiments and injected subcutaneously, usually just back of the ear, although a few injections were given in the axillary space. In the initial trials, the dose of insulin was varied according to the weight of the pig. This was discontinued because it was found that a large pig sometimes was more sensitive than a small one to a large dose of insulin. Injections were given to both fasted and nonfasted pigs, and occasionally the same pig was used for two experiments if recovery appeared to be satisfactory from the effects of the first trial. Blood samples, 2 cc. from each pig, were collected from the heart before the first injection was given and throughout the course of the experi-

ment. A graduated glass syringe and a short 20-gauge needle were found useful for this purpose. There is little danger to the pig from this procedure if the bleedings are not too frequent and the coronary vessels are not punctured. If the pig is held in the upright position and a sharp needle is employed, the sample can be collected with a minimum of risk that blood will gain access to the pericardial sac. The blood was added direct to 16 cc. of special 1.25 per cent zinc sulfate solution and the filtrate prepared in the usual manner. Sugar was determined by the Shaffer-Hartmann-Somogyi method according to the technique of Koch[9]. Approximately 24 pigs were used in the experiments. Data for representative experiments are summarized in table 1.

RESULTS

The symptoms most often observed following injections of insulin to pigs were listlessness, convulsions, and coma. Pigs that were not fasted prior to the administration of insulin often displayed only listlessness (fig. 1), even though 20 to 40 units of insulin were given at one injection. Injections of glucose, as reported by Magee and Harvey,[1] proved very effective in hastening recovery from hypoglycemia of short

[9]Koch, F. C.: Practical Methods in Biochemistry. Baltimore, (1934).

TABLE 1.—Experimental Insulin Hypoglycemia in Pigs.

EXPERIMENT	PIG NO.	WT. (LB.)	APPROX. HOURS FASTED	UNITS OF INSULIN INJECTED	APPROX. HOURS AFTER INSULIN INJECTION	BLOOD SUGAR (MG./100 CC.)	SYMPTOMS	TREATMENT AND TERMINATION
A. Effect of two doses of insulin (Nonfasted Pigs)	1	17	0	10	0	74.85	None	No treatment; apparent recovery
					1	47.46	Dull	
				10	3	30.51	Dull	
					6	14.69	Coma	
					10	....	Partial recovery	
					24	178.56	Recovery	
	2	32	0	20	0	75.71	None	No treatment; apparent recovery
					1	30.51	Dull	
				20	3	36.16	Dull	
					6	27.12	Convulsions	
					10	....	Partial recovery	
					24	114.45	Recovery	
B. Effect of a single large dose of insulin (Fasted Pigs used in A)	1	16	18	20	0	74.58	None	No treatment; pig died in coma
					2	19.21	Convulsions	
					3	....	Convulsions	
					6	16.95	Deep coma	
					8	14.69	Near death	
	2	31	18	40	0	89.27	None	No treatment; pig died in convulsions
					2	14.69	Convulsions	
					3	....	Coma	
					6	16.95	Coma	
					8	89.27	Convulsions	
C. Effect of large doses of insulin followed by glucose (Fasted Pigs)	5	4	24	40	0	99.44	None	20 cc. of 40% glucose administered intrap. at 8 and 12 hr. after insulin injection; pig died
					3	....	Convulsions	
					8	16.05	Convulsions and coma	
					12	....	Partial recovery	
					24	226.00	Partial recovery	
	6	5	24	40	0	99.44	None	20 cc. of 40% glucose administered intrap. at 8, 12, 28, and 36 hr. after first insulin injection; pig died
				20	3	....	Fairly active	
					8	14.24	Convulsions	
					12	....	Convulsions	
					24	50.85	Partial recovery	
					28	....	Partial recovery	
					36	110.75	Partial recovery	
D. Effect of large doses of glucose without insulin (Fasted Pigs)	9	4	24	0	0	97.20	None	20 cc. to 40 cc. of 40% glucose injected intrap. for 6 consecutive days. Blood sugar determination on 1st and 6th days. No apparent ill effects
						922.00	None	
	10	4	24	0	0	71.19	None	Same treatment with similar results
						800.00	None	

duration. Nonfasted pigs, however, frequently recovered without recourse to glucose if the convulsions and coma were not prolonged for more than four or five hours. This is illustrated by the results of experiment A, table 1.

Fasted pigs, on the other hand, especially pigs that had apparently recovered from the effects of insulin coma in a previous experiment, often failed to recover from the effects of prolonged hypoglycemia notwithstanding injections of liberal amounts of glucose as in experiments B and C, table 1. These observations are similar in many respects to those obtained by Sherrill and MacKay[4] with fasted dogs.

Other deleterious effects of severe and prolonged hypoglycemia reported by Sherrill and MacKay[4], such as respiratory failure, impairment of vision, incoördination, and disturbances of the emotional complex, were observed in some pigs. For example, two pigs developed total blindness after protracted coma of hardly more than four hours duration. Each of these pigs weighed approximately 20 pounds and received a single injection of 40 units of insulin following a 24-hour fast. One of the pigs was kept alive for two weeks by daily injection of 40 per cent glucose, but vision was not restored. Incoördination and increased docility were evident in both pigs after "apparent recovery" from coma. Sherrill and MacKay[4] found that one dog and four rats, in comatose hypoglycemia, promptly went into convulsions and died very suddenly when given water. This interesting phenomenon was observed in two 48- to 72-hour-old pigs that were allowed to drink cold water during the precoma stage of insulin hypoglycemia.

A normal value for blood sugar was found during severe convulsions in one pig. *See* data for pig 2, experiment B of table 1. The cause of this extraordinary rise in blood sugar was not evident, but Sherrill and MacKay[4] have stated that the sugar increases during hypoglycemic convulsions, and the value found at any particular time depends on how near a convulsion the specimen of blood is taken for the analysis. Repeated daily injections of 20 to 40 cc. of 40 per cent glucose to normal pigs had no deleterious effects. *See* experiment D, table 1.

Routine autopsy examinations, but no histopathologic studies, were made of the tissues of the pigs that did not recover from hypoglycemia. Edema of the muscular and connective tissues and occasionally pericarditis were found in a few pigs that died following protracted coma. The edema apparently was due to an impairment of the circulation and was especially marked in those pigs that did not respond favorably to injections of glucose. The few cases of pericarditis probably resulted from puncture of the heart in collecting specimens of blood for sugar analysis.

SUMMARY

The deleterious effects of severe and prolonged insulin hypoglycemia have been studied in young pigs. The most common symptoms observed following injections of insulin to pigs were listlessness, convulsions, and coma.

So-called irreversible or hyperglycemic insulin coma is likely to develop in pigs that are maintained in comatose hypoglycemia for more than four hours. Injections of glucose hasten the recovery from hypoglycemia of short duration but frequently have little value in prolonged hypoglycemia.

Severe and protracted insulin hypoglycemia in young pigs may cause other deleterious effects such as respiratory failure, impairment of vision, incoördination, and disturbances of the emotional complex.

It seems reasonable to assume that the experimental results obtained in this study may possibly explain the failure of many newborn pigs affected with so-called "baby pig disease" to respond favorably to injections of glucose.

ACKNOWLEDGMENT

The writers are grateful to the following persons, who in various ways rendered valuable assistance in the experiments reported in this paper: C. H. Wilson, J. F. Cummins, Vera Hanawalt, and Winifred Mitchell.

Recommendations on Swine Disease Control to Meet Wartime Needs

Special Committee on Diseases of Swine

Secretary of Agriculture Wickard has asked for a 15 per cent increase in our national pork crop for 1943. The task is a big one, but it can be accomplished—it must be accomplished.

The success attained in this undertaking will be determined to a substantial extent by the knowledge and care employed in handling its innumerable details. In assisting the swine raisers with many of these details, the veterinary profession will have one of the greatest opportunities in its history to prove its economic value in the field of food production. The present situation does more than offer an opportunity. It imposes a patriotic obligation. Because of his knowledge, training, and contacts, the veterinarian is peculiarly qualified to see that the program is properly planned, promoted, and carried out in his community. Our professional associations can greatly assist in helping to guide the national project along successful lines. Civilian veterinarians should have no hesitancy in assuming these responsibilities as part of the war effort. Swine have become more than the property of the owner; they now constitute necessary military supplies for the fighting forces. It is the responsibility of everyone to help produce and conserve them.

Since a large part of the national effort to increase pork production is a reduction in the pig mortality, your committee believes that the main portion of this article, even at the risk of becoming somewhat lengthy, should relate to the swine-husbandry practices through which this reduction may be accomplished.

Increasing our production of pork naturally will require: 1) breeding more sows; 2) raising a larger percentage of the pigs farrowed; and 3) perhaps feeding to heavier marketing weights.

Breeding More Sows

If the breeding of more sows would solve the problem, we could rest assured that the increase in pork would be forthcoming. It must be recognized, however, that many breeders and feeders in the Hog-belt have already reached the safety limit of their present facilities. It would be a serious mistake for them to add more sows, unless they enlarged their capacity to avoid overcrowding. Breeders who can increase their facilities should be encouraged to do so, and to assist them in the procurement of material for additional equipment, veterinary and farm organizations should petition the national officials charged with the rationing of scarce materials, when that step is necessary.

In every community, there are some farmers who are equipped to handle more sows than they have carried in the past. These farmers could contribute materially toward the increase required in 1943.

It is highly probable that more sows could be bred in some sections of the country where swine feedings has not been practiced extensively, but where suitable feed and climatic conditions might make it a profitable activity under present market conditions.

The veterinarian can effectively assist in the program for increasing pork production by discussing it with his clients, by noting the number of sows on farms, by tactfully persuading some farmers to increase the number, and by discouraging an increase where safe capacity has already been reached.

Raising a Larger Percentage of the Pigs Farrowed

It is not necessary to remind veterinarians that the death loss of pigs on North American farms is appalling. The mor-

tality for the entire country has been estimated at figures as high as 30 to 40 per cent of those farrowed. It is believed that close attention to the factors responsible for many of these deaths would result in an increase of pork exceeding that requested for 1943. By instructing their clients concerning these factors, the veterinarians can make a valuable contribution toward a reduction in the losses.

In an article of this nature, it is not possible to mention more than a few of the measures by which the death losses may be reduced. In general, they include measures applicable to the reduction of mortality in all farm livestock; namely: 1) improved breeding; 2) improved feeding; 3) improved management; and 4) improved disease control.

IMPROVED BREEDING

Under wartime conditions, improved breeding does not refer so much to improvement of blood lines as it does to the mating of healthy individuals which will produce good-sized litters and strong pigs. Quality may have to be sacrificed to a certain extent in order to obtain the necessary quantity.

Care should be exercised, as far as possible, to mate only healthy, strong, prolific breeding stock. If possible, only animals which have demonstrated their ability to reproduce satisfactorily should be selected. During the past year, the swine raising operations of many farmers have failed dismally through their efforts to use too many gilts, and young boars of unproved breeding record. As a rule, older breeding stock is more prolific and reproduces stronger offspring. Older sows usually produce more milk and take better care of their pigs.

The use of breeding stock of poor size and type usually bring disappointment. "Like begets like."

As much as possible of the breeding stock should be selected from the home, farm herd in order to guard against the introduction of infectious breeding diseases. If outside breeding animals must be purchased, they should be procured from a herd believed to be free from such diseases. In addition, such animals should be isolated from the home, farm animals for two or three weeks, or until it is not likely that they are harboring some infectious disease. Public stockyards and sales barns usually are not good sources of breeding stock.

IMPROVED FEEDING

Naturally, the proper nutrition of swine is of paramount importance in reducing mortality and making profitable gains.

The subject of feeding is so comprehensive that we believe the best advice to any veterinarian engaged in swine practice is to urge that he study a recently published authoritative textbook on feeds and feeding. A number of valuable bulletins on the subject also have been published by the United States Bureau of Animal Industry, by many state colleges, and by agricultural experiment stations. The swine feeds available in different sections of the country vary so greatly in their nature that the local state college bulletins or experiment station reports are especially valuable for owners and for veterinarians practicing in those particular sections.

It is important to remember that the nutrition of the pig begins with the feeding of the sows. Overfeeding may cause them to become too fat. Under-feeding may result in the farrowing of weak pigs or of pigs which develop hypoglycemia or so-called "baby pig disease". The sow's ration should include a sufficient quantity of protein. A proper part of the protein should be of animal origin (tankage, meat scraps, or milk products). In addition, minerals (especially calcium, iodine, and phosphorus) and vitamins are highly necessary. Pasture is important. If it is not available, legume hay should be fed.

After farrowing, the sow must be fed for milk production to insure strong, thrifty pigs. Many farmers forget that fact.

It should be added that the local feeds in practically all sections require supplementing to some extent with products which will supply adequate amounts of

protein (including protein of animal origin), minerals, and vitamins.

The veterinarian, through sound advice to his clients on feeding, can materially assist in reducing the tremendous losses of feed origin and thereby assist in increasing our national poundage of pork.

IMPROVED MANAGEMENT

Poor management is responsibile for the deaths of hundreds of thousands of pigs, annually. It frequently nullifies all of the benefits obtained from good breeding and good feeding. Good management involves many factors and practices, of which the following are a few.

Veterinarians engaged in field work report that lack of sanitation is, directly or indirectly, responsible for a great percentage of the death losses coming to their attention. The federal bureau of animal industry reports a recent survey indicating that only one-third of the farmers in the country follow good practices in the feeding and housing of swine. Improvement of this situation would, therefore, appear to be imperative if we are to produce more pork.

Contrary to some opinions, the pig is an animal which thrives best when its quarters are clean, dry, and comfortable. When maintained in an unfavorable environment, pigs may not thrive well, not thrive at all, or may contract one of the many so-called "filth diseases" and die. Hog raising, therefore, should be conducted where good sanitation can be practiced and where good hygienic conditions can be maintained.

The hog lots, especially the dry lots, should have good drainage, so that infectious, filthy material does not accumulate. The lots should be cleaned at frequent intervals. Many good farmers scrape the surface of the lots with a road scraper. Mud holes should be drained and filled, and feeders thoroughly cleaned frequently to remove spoiled feed. Water should be ample, convenient, and of good quality. Runways under buildings should be boarded up if they cannot be kept clean. At times, yards become so dusty that oiling or other dust treatment of the soil is necessary. Sunlight should have access to all parts of the lots. Manure piles and straw stacks should be fenced if pigs have access to them. The lots should be rotated; between uses, they should be cleaned, plowed, and perhaps seeded.

If central hog houses are used, they should be warm, dry, well ventilated, and free from drafts and dust. Failure to provide these features in the sleeping quarters causes the deaths of thousands of pigs every year. Dust, drafts, dampness, and dirt (filth) are the four "dangerous D's" in the lives of growing pigs. Owners seldom observe the faults in their facilities. Faults are frequently encountered in the most pretentious, as well as in the less expensive hog houses.

Good pastures are valuable assets to the swine raiser. To assist in parasite control, they should be rotated, if at all possible, so the young pigs may be placed on parasite-free soil. Ample shade and water, conveniently located, are extremely essential. Shade can be provided by a straw roof on wire over poles. An ample supply of salt should be available at all times.

Parasites.—The United States Bureau of Animal Industry is entitled to the credit of developing a phase of swine management for the control of Ascaris. It has been widely employed for a number of years and has proved very profitable in reducing losses from the so-called filth diseases or hog-lot infections. We refer to the "McLean County System of Swine Sanitation", which consists of the cleaning and disinfecting of the farrowing pens, the cleaning of the sows, and the protection of the sows and pigs from exposure to worm infection until they are transferred to clean pasture. The procedure is practical and profitable. It is believed that its general employment would do more to reduce swine mortality than any other single measure in swine management. Bulletins describing the system may be obtained from the United States Bureau of Animal Industry and agricultural experiment stations.

The United States Bureau of Animal Industry has developed other sanitary systems which are proving effective for the

control of certain other parasitisms of swine.

Even when maintained under good, sanitary conditions, some pigs become infected with parasites. Such animals should receive proper treatment. Many expellents are available for removing some of the internal parasites. Oily dips and sprays can be used to control lice. Lime and sulfur solution and certain other dips or sprays are effective in the control of mange.

Procurement of Feeders.—One feature of management which warrants serious consideration is the source from which feeder pigs are procured. From a disease-control standpoint, every swine breeder should raise his own feeder pigs, if possible, or purchase them from his own locality and from herds known not to be harboring one of the many infectious diseases to which swine are susceptible. Newly purchased pigs should be isolated from the native pigs for two or three weeks, or until they are believed not to be harboring some infection. Every year, the swine-raising operations of thousands of farmers are ruined from purchasing feeder pigs at public stock yards or at public sales barns and placing them in the farm herd immediately. It should be remembered that some feederweight pigs found at public sales yards were sent there because they were not "doing well."

IMPROVED DISEASE CONTROL

It has been indicated herein that the most effective measures for the prevention and control of a large portion of the death losses in swine concern the care and knowledge employed in their breeding, feeding, and management. Tremendous losses also result from specific, infectious diseases. If we are to succeed in further increasing pork production, their control and prevention must receive our most serious consideration. The list of these diseases is so lengthy that only a few high points pertaining to some of them can be mentioned here.

Hog Cholera.—Hog cholera is still the most destructive disease encountered in North American swine. It should, therefore, be considered first in every diagnosis.

The disease strikes so suddenly and "jumps" such great distances that the regular and systematic immunization of susceptible swine is the only safe protection. Many farmers postpone immunization until cholera reaches their community. That practice results in the loss of many thousands of pigs every year.

Diagnosis requires a full consideration of history, symptoms, and lesions. Since hog cholera is a septicemia, at times the lesions of other septicemic infections are confusing. In some cases, a differential diagnosis requires laboratory examinations and the inoculation of susceptible swine. When in doubt as to the diagnosis in nonimmunized herds, the case should be handled as hog cholera.

Swine Erysipelas.—This disease may occur at any point in the United States and in swine of any age. It is usually somewhat seasonal, but has been observed during every month. Unusually high temperatures, sudden deaths, stiff gait, enlarged joints, slight internal lesions, and skin lesions are suggestive.

Frequently, diagnosis is aided by the injection of liberal doses of anti-swine-erysipelas serum into 2 or 3 pigs which have not been sick longer than two or three days. Their pronounced improvement within twenty-four to forty-eight hours suggests erysipelas.

The antiserum is very effective in the treatment of the sick in the early stages. Some clinicians believe that it may help prevent the development of enlarged joints, when administered in later stages.

In some sections, successful swine raising requires the prophylactic, active immunization of the young pigs against this disease. Anti-swine-erysipelas serum and live cultures of the causative organism are used. In those sections, veterinarians are required to carry out this work under the direct supervision of their state livestock sanitary officials.

Infectious Enteritis.—At least two types of infectious enteritis are observed in pigs

older than the suckling age. They are identified as:

1) *Salmonella choleraesuis* enteritis, formerly known as Suipestifer enteritis.

2) Hemorrhagic dysentery or swine dysentery.

Salmonella choleraesuis enteritis is sometimes identified as Suipestifer enteritis, necrotic enteritis, and paratyphoid. At the present time, *Salmonella choleraesuis* is quite generally regarded as the causative agent. *Actinomyces necrophorus* and *Balantidium coli* are usually regarded as secondary invaders. Further research may reveal other causative factors.

This type may be encountered in acute, subacute, or chronic forms. In its more acute forms, it is septicemic; the pigs may die suddenly and may manifest no diarrhea. Very few lesions of enteritis may be present, but instead, there may be lesions of a septicemia. In the subacute or chronic forms, the intestinal symptoms and lesions are more pronounced. The latter usually indicate some stage of a diphtheritic, caseous, or necrotic enteritis, affecting chiefly the cecum and colon, but it may involve any part of the digestive tract below the oesophagus.

Irregular appetite, fluctuating temperature, emaciation, arched back, weakness, a pronounced diarrhea which may be intermittent, and dark, foul feces are the outstanding symptoms.

In the control of this disease, rigid sanitary measures are of paramount importrance. Healthy pigs should be separated from the sick, moved to noninfected soil, if possible, and the infected premises should be thoroughly cleaned, disinfected, and permitted to stand idle for several months before restocking with swine. There is no specific therapeutic agent for the disease. Many veterinarians administer an alkali, or an alkali and nicotinic acid preparation in the feed or water. Some also administer bacterins in the hope of increasing resistance to the causative organisms. A buttermilk diet is recommended by some. A measure recently employed by J. S. Koen in Iowa appears to hold promise. It is known as the "sodium chloride treatment". Whole oats are soaked in salt water (1 lb. of sodium chloride to each 5 gal. of drinking water). A light feed of the oats is given to the pigs twice daily for five days. After an interval of three days, the pigs may be placed on the "sodium chloride treatment" for a second period of five days. No other feed is supplied. If buttermilk is being fed, 10 lb. of sodium chloride are added to each 50 gal. of buttermilk and this is fed five days, with no other feed. In either method of feeding the salt, it is extremely important that an abundant supply of fresh water be maintained within 20 or 30 feet of the feeding floor.

Hemorrhagic Dysentery or Swine Dysentery.—The specific cause of this disease has not been definitely determined. However, there is evidence indicating that it is infectious in nature. Thousands of swine herds have been ruined by the purchase of infected feeder pigs and breeding stock which in many cases were added to the farm herd without an isolation period.

Elevated temperature, sluggishness, diminished appetite, weakness, and pronounced diarrhea with bloody feces ("tomato feces") are the outstanding symptoms.

The disease affects chiefly the cecum, colon, rectum, and stomach. The small intestine is rarely involved, or but slightly affected.

The lesions consist of an extensive blood engorgement and pronounced hemorrhages of the mucosae. In the late stages, necrotic areas and ulcers, extending to the muscular coat of the intestine may be found.

The "tomato feces", the portion of the intestine involved, and the extremely hemorrhagic lesions are helpful in diagnosis.

No specific treatment is known. The therapeutic agents and measures described under *Salmonella choleraesuis* enteritis are also employed in the treatment and control of this disease. Infected premises should not be restocked for three or four months after they have been thoroughly cleaned and disinfected. Prevention and control require the most rigid sanitary measures

and the utmost care as to the source of purchased swine, as well as their isolation before adding them to the farm herd.

Coccidial Enteritis.—Enteritis caused by coccidial infection has been studied experimentally and natural cases are occasionally encountered in the field. At the present time, it is believed that its economic importance is much less than that of the preceding types. The same measures are employed in its control as those described under enteritis caused by *Salmonella choleraesuis.*

Scour in Suckling Pigs.—This condition is regarded as a digestive disturbance. It is characterized by a severe diarrhea and frequently by high mortality.

The primary cause is believed to be some fault in the diet of the sow, although there is reason to believe that pathogenic members of the colon-typhoid organisms play an important part in some outbreaks.

Therapeutic measures include correcting the diet of the sow and feeding to reduce her milk flow. Formalin may be administered to the sow in milk. The well litters and sows due to farrow should be moved to a noninfected part of the premises. Treatment of the sick is not very successful. However, calf scour antiserum or intestinal astringents are sometimes of value. Thorough cleaning, disinfection and general sanitary measures are imperative in the control of this disease.

Swine Influenza.—It is caused by the combined action of the specific virus of swine influenza and a bacterial organism, *Hemophilus influenzae suis.*

In some herds, the disease strikes in storm-like fashion, characterized by numerous cases showing serious respiratory involvement, a sudden termination, and low mortality. In other herds, it is more insidious, leading to pulmonary complications which are prolonged and cause a substantial death loss.

There is no specific treatment. Warm, dry, draft-free, and dust-free quarters are essential. The sick should be isolated from the well. Supply light feed and ample water. Guaiacol, iodine, and other indicated drugs are administered in the water or feed. Volatile inhalants may be sprayed in the pen. Proper sanitary measures and good nursing are imperative. Where pneumonia develops, some veterinarians administer sulfathiazole, 0.5 gr. per lb. of body weight, daily, until improvement occurs.

Hemorrhagic Septicemia, Swine Plague, or Pasteurellosis.—This disease, caused by *Pasteurella suiseptica,* is quite prevalent in some sections, while in other sections it rarely occurs. Throughout the country, it causes the death of many pigs, annually.

Its prevention and control require the same sanitary and other measures as for swine influenza. In addition, biological products are employed by some veterinarians.

Pneumonia. — Various types of pneumonia contribute greatly to the annual death loss of swine. In many instances, it is observed as a complication or phase of a specific infection such as *Salmonella choleraesuis* enteritis, pasteurellosis, swine influenza, etc. In other instances, the primary factors may be such agencies as exposure, irritants, dust, drafts, damp quarters, and insanitary premises.

Measures for prevention and control in each instance will depend upon the cause. The therapeutic, sanitary and hygienic measures recommended under swine influenza are of value.

Brucellosis or Infectious Abortion.—The disease, extremely serious in some sections, is responsible for the annual loss of a tremendous quantity of potential pork. It is caused by *Brucella abortus suis,* an organism highly infectious for man.

Diagnosis is made by the bacteriological examination of tissues from an aborted fetus or by agglutination blood tests.

Control is by prevention, particularly by good sanitary measures and careful selection of breeding stock. The disease can be eradicated from a herd by a modified application of the "test and removal" plan employed for the control of brucellosis (Bang's disease) of cattle.

Swine Pox.—This disease is a more serious condition in some sections than is generally supposed. It occasionally causes

serious losses following hog-cholera immunization or following other factors which reduce resistance. Lice are very important factors in its spread. Lime and sulfur solution may be used as a dip or spray. Sulfurated oil also is recommended by some veterinarians.

Nutritional Anemia of Suckling Pigs.—The loss of many thousands of suckling pigs could be prevented each year by making a preparation of iron and copper available to them. The individual treatment is the most dependable, although the drugs may be placed on the udder of the sow. Clean, parasite-free sod or soil placed in the pen is also a helpful preventive. If preferred, the iron and copper preparation can be added to the sod or soil placed in the pen.

This condition is especially likely to develop in pigs raised in buildings having concrete or board floors, where they do not have access to the soil.

Acute Hypoglycemia in Newborn Pigs or Baby Pig Disease.—In some sections of the country, death loss of pigs during the first seventy-two hours of life is extremely high. Recent research suggests that many of these deaths may be due to hypoglycemia. Anorexia, dullness, shivering, weakness, coma, and death in twenty-four to thirty-six hours are the chief symptoms.

Intraperitoneal injections of glucose, in addition to hand-feeding of sugar solution or milk, are proving of some benefit. As a preventive measure, it has been suggested that the grain and good quality protein in the ration of the sow be kept at liberal amounts until the time of farrowing, to insure an adequate supply of milk. Apparently, it is extremely important to see that the pigs receive proper nourishment during the first twelve hours of extrauterine life. Some swine raisers reduce the grain in the sow's ration some time before farrowing. That may prove to be an undesirable practice.

SANITATION IS OF PARAMOUNT IMPORTANCE

It should be emphasized that proper sanitation is very important in the prevention and control of most of the specific, infectious diseases listed above. For example, the infectious types of enteritis, pasteurellosis, influenza, and the various kinds of pneumonia are especially likely to occur when the pigs have suffered some devitalizing exposures, such as shipment, inclement weather, change of feed, cholera vaccination, castration, and many others. Therefore, the correction of sanitary and hygienic conditions is indicated in the prevention and control of practically all of the diseases which cause grave death losses in swine.

Good sanitation must extend far beyond the farm, if we are to succeed in curtailing swine mortality. Stock yards, sales barns, transportation equipment, and many other factors involved in the intrastate and interstate movement of animals play an important part in these death losses. Our livestock sanitary officials are giving due consideration to these factors during the present emergency.

Proper attention to sanitary measures on the part of farmers, veterinarians, livestock sanitary officials, and others engaged with the production and transportation of livestock can materially reduce the mortality of North American swine and thereby contribute greatly toward our national effort to increase pork production in 1943.

T. W. MUNCE, *Chairman*
L. P. DOYLE J. S. KOEN
E. V. HOVER T. L. STEENERSON
Special Committee on Diseases of Swine, American Veterinary Medical Association.

Widespread epizoötic diseases since time immemorial have raided the cattle population of India. The control of these plagues having been recognized as important since the early days of bacteriology in the nineteenth century, the Imperial Veterinary Research Institute was established to improve the welfare of Indian agriculture. The result has been the practical control of the diseases for which the Institute was founded.—*From a Popular Account of Veterinary Research under the Government of India, 1941.*

Our fur farmers sold 6,000 pelts in 1923 and 350,000 in 1940.

Swine Erysipelas a Menace to Production

W. T. SPENCER, D.V.S.

Omaha, Nebraska

EXPERTS in the food industry calculate that the United States will have to furnish food for 200 million people outside of our own population. The lowly American hog will be called upon to supply much of this huge order. There must necessarily be a tremendous increase in swine production in the United States. With rapid increase in numbers produced, there will be a lack of facilities for proper handling on many farms. A great many who lack experience in the problems of swine production will attempt to grow swine. These factors will multiply the ever-present disease hazards and require constant vigilance by owners if their herds are to be protected from unnecessary disease losses. Many complications are involved in dealing with infectious diseases. The service and coöperation of trained veterinarians is most essential in blocking disease losses.

Swine erysipelas will take a heavy toll under the increased production program unless intelligent effort is directed toward its control. This infection has been present for a long time in the United States but has been inactive and causing no serious trouble until recent years.

In 1930-31, a disease resembling hog cholera, but which did not respond to recognized methods of control for cholera, appeared among scattered herds of hogs in Nebraska and South Dakota. The trouble in these herds was swine erysipelas. The field diagnosis was confirmed by state and commercial laboratories.

During the drouth years of 1934-36, the extensive traffic in feeder pigs apparently spread the infection widely.

While the disease has gained a foothold and is a problem of major importance, the percentage of farms involved is still relatively small. Therefore, every precaution should be exercised to prevent general distribution of the infection.

Nebraska pioneered in an experimental program, under the direction of L. Van Es of the Nebraska College of Agriculture, to determine the feasibility of serum-culture inoculation in the prevention of the disease. Results have been satisfactory. The Nebraska plan has been extended by the United States Bureau of Animal Industry to include Iowa, South Dakota, and other states.

NATURE OF SWINE ERYSIPELAS

Swine erysipelas is treacherous. It often creeps into herds and remains for months before it is recognized. It is contracted through contaminated feed, water and infected soil. The germs of the infected animal are discharged through body excretions. The disease occurs in either acute or chronic form.

Acute Form.—In the acute form, one or more hogs found dead may be the first indication of trouble. Others quickly sicken and are apt to be found away from the herd. Soreness of the legs with lameness, arched back and swelling of the joints are frequently present. Reddening of the skin with peculiar diamond-shaped spots is sometimes seen. High fever, ranging from 107 to 110 degrees, is found in sick animals in the very early stages of development. The temperatures usually drop to 104 or 105 degrees in twenty-four to forty-eight hours.

Frequently, it is difficult to tell the difference between acute swine erysipelas and hog cholera. The symptoms are much alike in many herds and so are the findings after death. Inflammation of the body linings, congestion of the lungs, liver and spleen with small hemorrhages of the membranes of the heart, kidney, and bladder are present. The stomach is congested; and the spleen, moderately enlarged, is bright red. In uncomplicated hog cholera, there is little or no change in the size, color or con-

Regional manager, National Live Stock Loss Prevention Board.

sistency of the spleen. Sudden deaths are not so common in hog cholera as in swine erysipelas.

The history of the infected herd should assist in determining whether it is erysipelas or cholera. The record indicating whether the herd has been immunized against cholera and the time of the year are important factors. High fever usually continues for several days in hogs affected

Fig. 1—A rapidly fatal case of swine erysipelas.

with cholera but usually drops in twenty-four to forty-eight hours in swine erysipelas. Swine erysipelas is more prevalent in the summer months than during the winter months and it is much more apt to attack suckling pigs than is cholera. The acute form is often encountered and if the herd is not properly treated, many will become stunted, develop big joints, and the disease will become chronic.

Chronic Type.—There are a great many cases on record that indicate a chronic infection having lingered in herds for months, and occasionally for one or two years before deaths from the disease occurred. These cases are especially dangerous. As owners do not usually recognize the danger, diseased animals are permitted to remain in the herd or may even be sold to go into clean herds where they continue to spread the infection.

In this type, affected animals become unthrifty. There may be sloughing of the ears and tails. The most common symptom is enlargement of the joints.

Since 1928, evidence of this form of the disease shows an increase of almost three times the number of animals affected. There were 6,991 carcasses retained by government inspectors on account of arthritis in Omaha packing houses during the first six months of 1942. Approximately, 1,000 of these carcasses were entirely condemned.

PREVENTION AND CONTROL

Every hog raiser should know how to prevent this disease and take the necessary measures to protect his herd from infection. Once the infection of swine erysipelas is brought onto the farm, it remains a source of danger for years. There is no practical means of disinfecting the infected soil.

The following precautionary measures should be taken when additions to the farm herd are planned.

The history of the herd from which additions are to come should be carefully investigated. Swine that appear healthy may be carriers and spreaders of infection.

New purchases should always be kept separate from other hogs on the farm for a period of ten to thirty days to establish freedom from erysipelas as well as that of other infectious diseases.

Vaccination.—If the disease has been present on the farm in recent years, all pigs should be vaccinated within one to ten days after they are farrowed. This

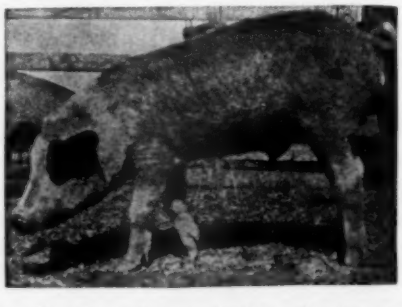

Fig. 2—Chronic swine erysipelas, showing articular tumefactions.

time limit is very important. There is a tendency on the part of some hog raisers to delay vaccination until all pigs are farrowed. This often results in the early pigs contracting the disease and thus continues to spread the infection. Sows should be bred to farrow on dates as close together as possible.

Traffic.—Dr. Van Es offers the following

suggestions for prevention and control of the disease:

"Prevention of the spread of the disease from farm to farm cannot be overemphasized at present when the infection has not yet acquired a general distribution. Traffic in swine should be under more rigid supervision and control. Public sales establishments, which are apt to have apparently healthy hogs from infected herds consigned to them, may materially protect the interests of their buyers by causing all swine passing through their hands to receive a suitable dose of erysipelas serum. No small amount of mischief may be prevented by such a simple and relatively inexpensive measure."

The culture used in vaccinating for swine erysipelas is a product containing living germs that are infectious to other live stock and to man. Therefore, its use by inexperienced persons should be avoided. Its use is restricted and it may be obtained and administered only by veterinarians approved by your state live stock sanitary officials.

Some Points in Calf Feeding[1]

The feeding of calves is divided, physiologically, into three periods: (1) the "monogastric" period, from birth to the twelfth day, (2) the period of transition from the monogastric to the polygastric state, lasting from the twelfth to the thirteenth day, and (3) onset of the rumination period.

Since calves are born depleted of vitamin A, the vitamin A contained abundantly in colostrum is essential to the calf's proper nourishment. Its absence is tragic, often fatal from scours, pneumonia and lack of resistance to infections.

Vitamin B, preceding the period of rumination, must be furnished by the milk fed. After rumination, vitamin B is synthesized by bacterial action in the rumen. It requires a gallon of whole milk per day to supply a calf with adequate amounts of the B complex.

Vitamin C is abundant in the newborn calf but is depleted the first twenty-four hours, after which and up to the third to the fifth week, it must be supplied. Thereafter, as occurs in all ruminants, ascorbic acid is self-made.

Vitamin D is of no special concern in calf feeding during the first several weeks of bovine life.

When calves require a supplement of vitamin A, 40 drops of shark-liver oil per day will answer the purpose, but if it fails to correct diarrhea niacin is added. Niacin frequently cures scours promptly.

Calves should be given access to hay at 2 weeks of age and encouraged to eat grain early. Hay supplies carotene which will correct vitamin A deficiency. Calf ration 5 of the Wisconsin station consists of:

Ground yellow corn	32 parts
Ground oats	32 parts
Soybean oil meal	14 parts
Linseed oil meal	6 parts
Wheat bran	8 parts
Bone meal and salt *aa*	1 part

In making up calf rations of this type, ground alfalfa meal, dried skim milk, and brewers' or bakers' yeast may be used for such of the meal ingredients that are not obtainable.

[1]An abstract.

India

India is a factor in this war because her population of 388 million represent one-fifth of the human race and her mineral resources are equal to those of the United States and in some respects far greater. She has the largest sugar output in the world and flourishes in the production of rice, tobacco, cotton, tea and wheat. Her annual steel output is 2 million tons, and she has enough bauxite to furnish half of the world with aluminum, and has more mica than any other country. Her water power ranks with that of the United States and Canada, and she maintains a standing army of 1.25 million men. Though short on equipment, the Indian soldier is rated high for endurance and skill — *Abstract from Letter No. 1216, Whaley-Eaton Service, Aug. 4, 1942.*

The post-war world will follow the pattern used since Jehovah God made man, good intentions notwithstanding.

Wartime Problems of Zoological Gardens

FRANK D. McKENNEY, D.V.M., M.S.

Balboa Park, San Diego, California

THE PROBLEM of maintaining zoölogical exhibits during war times is one that has been the cause of much public discussion and has given rise at times to exciting, but very false, rumors. This is particularly true of the institutions located in or adjacent to defense areas that are most accessible to aerial bombings by enemy nations. Wild speculation as to results of such an event is perhaps the only one considered by the people of such a community, but certainly it is not the most difficult problem facing those charged with the care of zoölogical collections.

BRITISH EXPERIENCES

Let us consider for a moment the results of repeated bombings on a large zoo such as the one in London. Certainly, this has received much more punishment in the way of aerial bombings than anything we expect in this country. We are informed that the London Zoo has been bombed 75 times since the start of the war. There has been considerable damage to the buildings and some of the exhibits have been killed, but the only animals that have escaped have been a few harmless zebras. Few extra precautions have been taken by the London Zoo except to remove some of their more expensive and easily moved exhibits to places of comparative safety. We frequently receive newspaper clippings of supposed removal of dangerous reptiles or animals from zoos along the coasts inland, but, at the present time, to the best of our knowledge, no such exodus has taken place.

SPECIAL DIETS SCARCE

Of more immediate concern to those of us engaged in such work is the provision of adequate diets for the animals and birds in the face of wartime shortages and constantly rising prices of some of our more common food products. For example, the banana is one of the most common articles of diet in all zoölogical gardens and rather difficult to replace in the diets of some of the exotic birds and animals. Difficult to replace, not so much from the standpoint of nutrition as from the standpoint of substituting another food equal in palatability as well as in nutritive value. Most of you are accustomed to buying half a dozen or so from the vegetable market when and if they tempt your appetite, but it is a difficult matter to provide a complete stalk or approximately 100 lb. of these each day in the face of increasing restrictions on shipping. Since bananas cannot be stored successfully, a constant source of supply is required. Quantities of cod liver oil formerly used by these institutions are now difficult to obtain and prohibitive in price. The removal of all Japanese from large areas along the Pacific coast has caused at least a temporary shortage in garden produce. This is a problem affecting the entire public, and steps are being taken by the government to correct a situation that has developed over a period of years. Strict regulations under which all fishing fleets must operate made it impossible during December and January to fill our usual requirements for such fish as mackerel, smelt, and sardines. Our facilities for freezing and storing up to 30 tons of fish enabled us to maintain our exhibits until a part of the fleet could resume its activities.

Zoölogical gardens in England, likewise, have admitted that their animals and birds are being reduced in numbers, not because of danger to the public in the event they should escape, but because of the lack of food supplies. This is an unfortunate situation as we believe that zoölogical gar-

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Veterinary Pathologist, Biological Research Institute of the Zoölogical Society of San Diego.

dens fill a great need in our defense organization in maintaining public morale. Attendance at the zoos in England has greatly increased since the start of the present war because a zoölogical garden is a form of recreation that appeals to all classes of people and the environment is usually such that they can temporarily escape from troubles incident to a nation at war.

No information has as yet reached us concerning the fate of some of the wonderful collections of animals and birds in enemy-occupied countries of Europe and Asia. Due to known food scarcity in some of these countries, it is extremely doubtful if many have survived. One can certainly hazard a guess as to the fate of a fat deer or antelope in a community of starving people.

PRECAUTIONS AGAINST ESCAPES

Let us consider for a moment the precautions some of the zoos in coastal areas have taken to protect themselves against possible enemy air attacks. In such precautions, it is necessary to assume that the worst will happen. In other words, an attack will come during the day and at a time when the zoo is filled with visitors, as most of them are during a week end or holiday. Under such circumstances, our first concern must be for the welfare of the public. This means proper policing of a frightened public and establishment of first aid casualty stations, fire prevention crews, and decontamination units. In our zoo, all employees have been given special training in one or more fields which they must serve. Instruction in these duties is about the only assistance that could be offered by the Office of Civilian Defense, so that special requirements for equipment or materials must be met for the most part by the institution. The next thought, of course, is for the safety of the animals and the protection of the public from those that might escape. In this respect, the San Diego Zoo is very fortunate since, because of our mild climate, exhibits are all maintained in open air grottos or in outdoor cages. The night houses for most of our large primates, cats, and bears are small structures of reinforced concrete. We are advised that these structures would withstand considerable punishment from demolition bombs except for broken windows or skylights which would not release the animals. A direct hit by a large demolition bomb would, of course, destroy the small buildings, but it is believed that little regard need be given in such event to the escape of the animal or animals inside. High-power rifles have been placed in strategic locations in the zoo for the use of our most dependable employees so that dangerous animals which might escape can be destroyed immediately. We all hope that such measures will never be necessary, but few of us are either mentally or physically equipped to cope with the necessity of amusing a loose Kodiak bear or a 600-lb. gorilla while dodging demolition or incendiary bombs. Other zoos, in climates which require large buildings for winter quarters, have had slightly different problems, but in these cases prevention of fire from incendiary bombs is the primary problem they have had to solve. Those zoos equipped with fireproof animal quarters are most fortunate.

DANGER FROM SNAKES NEGLIGIBLE

It seems that the public is usually more concerned about the possibility of the escape of the reptile collection, particularly the poisonous snakes, than they are about the large mammals. This has always seemed somewhat peculiar to me since there are more venomous reptiles loose in the canyons and hills surrounding San Diego than there are confined in any one reptile collection in the world. The tropical, poisonous reptiles would find the climate even in San Diego unsuitable and would soon die or at least become inactive if they should happen to escape. To preclude the possibility of bombs or other disaster releasing animals or reptiles on an already frightened public, many of our employees have their homes within the grounds and other key employees return to the grounds in the event of a black-out. By this method, an adequate force is always at hand to care for all emergencies.

SUPPLY OF REPLACEMENTS LACKING

Another effect of the war upon the maintenance of zoölogical gardens is the lack of supply of new animals and birds for replacement. Every zoo must face a certain mortality in its exhibits each year and in general the mortality is greatest in the rarer species. Those most difficult to maintain in captivity are usually quite rare and, consequently, most highly prized by the larger zoos. This lack of supply does not mean that any zoo must close its gates to the public, but new accessions will be limited to surplus animals obtained from other zoos in the United States, and it also means that some of the more rare species may temporarily disappear from collections in this country. For instance, the San Diego Zoo is the only one in the United States to exhibit the large Guadelupe Island Elephant Seals (*Mirounga angustirastris*); since the recent death of our last specimen, this particular species can no longer be seen except in its native habitat and cannot be replaced until after the war. Absence of such exhibits will not be noticed to any extent by the public, except those that visit the zoo regularly, as the cages or grottos will be filled with perhaps less rare, but often more amusing animals or birds.

SUMMARY

The problems of a zoölogical garden are perhaps not as great, during an all-out war, as in many other lines of business, and certainly we do not wish to complain or ask for changes that would hinder an early attainment of this country's objectives. We can, however, hope that we are helping win that objective by "carrying on."

Rotenone, the normal supply of which was cut off by the Jap invasion of the Pacific islands, can be grown in this country. Four-year-old plants of Devil's Shoestring tested at Auburn, Ala., are producing 1 per cent rotenone in considerable quantity. Devil's Shoestring grows from seeds or root sections planted in rows like cotton or corn.

Dogs in This Global War

Not since the early days of the Hudson Bay Company and the Northwest Mounted Police has the practicability of the dog sledge been realized as much as at the present time. In the snow-clad countries,

—From Kennel Gazette

dog teams and sledges have become essential means of transportation. Owing to the short cut by air from Occident to Orient over the frozen North, dog-sledge travel and freighting between outlying stations may take on importance never before dreamed of in the history of man.

Drying Foodstuffs

Foods deprived of water are called "dried," "sun-dried," "evaporated," and "dehydrated." "Dried" signifies the removal of water by any means, "sun-dried" is self-explanatory, and "evaporation" and "dehydration" refer to drying with artificial heat—natural draft for evaporating and forced draft for dehydrating. The latter, though the more complicated, is the rapid way. At 150 to 180 F., vegetables are completely deprived of moisture in a few hours, and there is no great loss in vitamins, minerals, flavor or color, if properly done. All bacteria are, of course, killed and enzymes at least of meat, are inactivated. *—Science Digest.*

The Story of John M. Buck's and Matilda's Contribution to the Cattle Industry

R. R. GRAVES

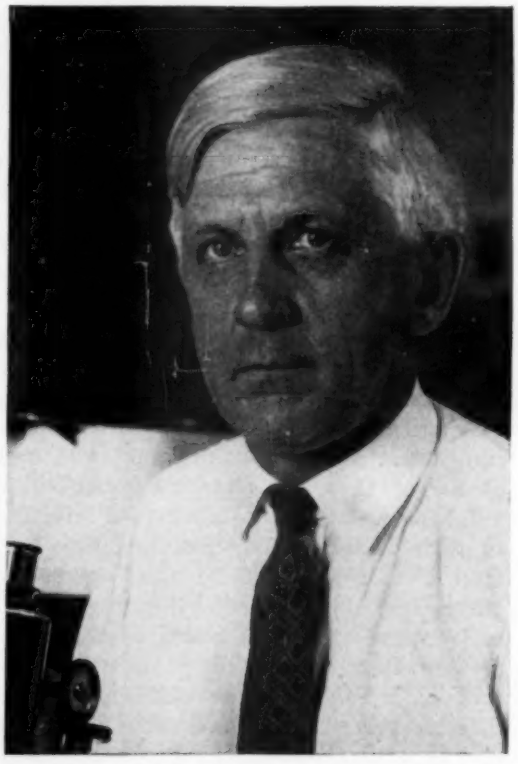
Beltsville, Md.

BREEDERS OF dairy cattle know that a large proportion of the animals in our principal dairy breeds have descended from a remarkably small number of foundation cows. *DeKol 2d* was the foundation cow for large numbers of our present day Holstein-Friesians, *Coomassie* for a great many of our Jerseys, and *May Rose 2d* for a large proportion of our Guernseys. Each of our breeds has also had some great sires—sires whose germ plasm enabled them to be great breed improvers.

We know, too, that certain men, through their discoveries and inventions, laid many of the stepping stones on which our modern civilization has advanced. Perhaps there are few men to whom we are more indebted than Louis Pasteur, who discovered the nature of fermentation and how to control it by "pasteurizing" or heating the solutions to temperatures that would kill the bacteria responsible for fermentation. He also discovered the cause of certain contagious diseases and methods of preventing contagion and how to minimize the effects of the disease when contracted.

Pasteur's work, which laid the foundation for much of our modern bacteriological and medical technique, was done from forty-seven to seventy years ago. He once said: "Take interest, I implore you, in those sacred dwellings which one designates by the expressive term 'Laboratories.' Demand that they be multiplied, that they be adorned. These are the temples of the future—temples of well-being and happiness. There it is that humanity grows greater, stronger, better."

Out of another laboratory has come scientific information in recent years that is resulting in the control of one of livestock's most costly diseases, brucellosis, commonly called Bang's disease or contagious abortion. It is a bacterial infection that may cause a cow to expel the fetus before it is mature, with consequent loss of the calf and a lower milk yield for the lactation period. Breeding troubles often follow in the infected animals. Some herds have some abortion year after year; but when Bang's disease first occurs in a free herd, a storm type of infection may result and almost every pregnant cow may abort within one or two years.



The late John M. Buck, former bacteriologist in the Pathological Division, Bureau of Animal Industry, Washington, D. C.

The method that has been used in recent

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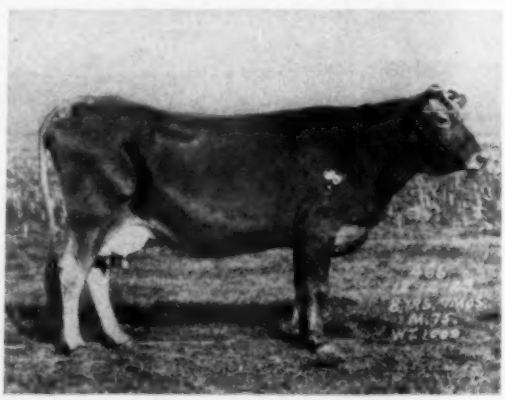
years for freeing herds of Bang's disease is to test each female for the presence of the Brucella organism and to slaughter all reacting animals. A coöperative state and federal campaign to eradicate the disease was begun in July, 1934. Up to Sept. 30, 1942, 55,981,678 tests and retests were made for Bang's disease by the Bureau of Animal Industry and the coöperating state agencies. As a result of these tests, 2,389,945 reactors have been removed. The Bureau of Animal Industry says that estimates of losses from Bang's disease in the United States have varied from 30 million dollars annually to much larger amounts.

In the period from 1922 to 1925, the writer went frequently to the laboratory of the late John M. Buck, veterinary bacteriologist in the Pathological Division of the Bureau of Animal Industry, to discuss the progress of his work in immunizing calves against Bang's disease, because our experimental dairy-cattle breeding herd at Beltsville was experiencing an outbreak of "Bang's." Doctor Buck was one of the most conservative of research workers. At that time, he did not seem to hold out much hope for successful immunization. He would show me the records of cows that had been vaccinated as heifers (but not with vaccine strain 19 referred to later) and that continued to react after they came into milk, some of them harboring the infection in their udders. We didn't get any help from Doctor Buck at the time, but solved our problem by separating the infected animals from the uninfected animals and moving them to another farm. We succeeded in raising clean calves from the infected herd, but it was a rather laborious and expensive procedure.

But a little later, there came out of Doctor Buck's laboratory a vaccine that proved to be highly successful in immunizing calves against Bang's. This vaccine is now familarly known as strain 19. It is being widely used. Will it be the means of controlling this expensive disease, or perhaps even eliminating it from our herds in time? Prospects for both results are favorable. Certainly, a lot of breeders sleep better because they know there is little or no danger of an outbreak of abortion in their immunized animals.

England is making strenuous efforts to control some of the common cattle diseases in order to facilitate greater production. Last year, a representative of the Bureau of Animal Industry flew to England, carrying with him some strain 19 cultures from which vaccine is being made for use on British herds. Certainly, Doctor Buck and his associates made a great contribution to the cattle industry of this, and probably other countries.

Livestockmen will be interested in Doctor Buck's silent copartner in this great contribution. Perhaps she made his contribution possible. Her name is *Victor's Lady Matilda* and her herdbook number in the American Jersey Cattle Club is 358592. Her sire was *Lady Letty's Victor* 65020 with 41 Register of Merit daughters, and her dam was *Lady Letty's Matilda* 290450.



Victor's Lady Matilda

Victor's Lady Matilda was bred by Valley Hawkins, Fawn Grove, Pa., and she was born May 3, 1915. She was sold to Ayrdale Farms at Bangor, Maine, and was selected from that herd by the writer in June, 1921, largely because she was a linebred St. Lambert, one of the early popular Jersey families. She was to be used in a family-crossing experiment. She was an unusual red fawn in color, and this striking color persisted in her descendants for several generations.

She made two records, one of 7,220 lb. of milk and 359 lb. of butterfat at 2 years

9 months of age; and the other, 10,861 lb. of milk and 584 lb. of butterfat at 5 years 4 months of age. At Beltsville, she dropped three heifer calves. One daughter made a record of 571 lb. of butterfat at 2 years 6 months and a second record of 764 lb. of butterfat at 6 years 10 months; the second daughter made a record of 545 lb. of butterfat at 2 years, and the third daughter made a record of 412 lb. of butterfat at 2 years 11 months and a second record of 664 lb. of butterfat at 5 years 2 months.

After the third calf, Matilda became sterile. We have no record that she ever aborted, but she did become a positive reactor to "Bang's" in 1923. She was moved to our isolation herd of positive animals when that unit was established in May, 1926. She was slaughtered the following November.

A. B. Crawford, of the Animal Disease Station of the Bureau of Animal Industry at the Beltsville Research Center, advises me that Doctor Buck recovered the *Brucella abortus* from the milk of Matilda in June, 1923, and that the organism was then virulent. After the culture was made, it remained on Doctor Buck's desk at room temperature, together with several other cultures, for a year or more. When tested again, the organism taken from Matilda's milk had lost much of its virulence. The virulence became established at that low point and, in the hundreds of culture transfers made from it since, the virulence has not materially changed. This is the strain 19 that is being used so extensively today for the preparation of vaccine for vaccinating calves against abortion. It is strain 19 because it was the nineteenth stock culture of a series isolated by Doctor Buck, but a much larger number were used in the research on vaccination against the disease.

The number of calves being immunized with vaccine from strain 19, under the supervision of the Bureau of Animal Industry and the coöperating state officials, is quite large, running from 12,000 to 17,000 head per month.

If there is a cow heaven, *May Rose 2d* probably views with pride and amazement the extent of the spread of her germ plasm in the Guernsey breed. *DeKol 2d* would share that feeling in viewing her numerous descendants in the Holstein breed, and no doubt *Coomassie* would be no less proud of her contribution to the Jerseys. But old Matilda can feel even a greater pride, for without her contribution, with Doctor Buck's aid, or is it Doctor Buck's contribution with Matilda's aid, many of the descendants of the *Coomassies*, *DeKol 2ds*, and *May Rose 2ds* would never have lived to make their contributions of milk and meat to mankind.

The Cow He Left Behind

The tremendous output of American farms in 1942 in the face of the politically alleged drain of farm boys to the armed forces is either a practical joke on manpower or a good recommendation for the cows the boys left behind. The quantity of milk produced during the fiscal year now ending was enough to float the United States Navy, says a release of the United States Department of Agriculture. Obviously, therefore, there are factors other than manpower that enter into milk production. If what is being said about selling good milk-cows to the butcher and deserting the land because farm boys are joining the Army and Navy is true, drafting farm boys is a good recipe for stepping up milk production. We know that they'll make good fighters, and also that no plan for keeping farm boys out of the armed forces has yet been brought forward. Farm boys are not slackers. They swim like fish among machinery and if the cows left behind will do as well without them as they did in 1942, everything is hunky-dory.

In lieu of the customary production of butter from surplus milk, milk powder, evaporated milk and cheese are changing the whole plan of dairying, and plans are in operation for financing the means of producing these on the farm. In other words, the cream separator is being replaced with other machinery never before dreamed of as farm equipment.

Publication Rules of the AVMA

Tense and Gender

L. A. MERILLAT

TENSE

The modification of verbs to express the time of an action should be consistent. Of the six tenses commonly studied, only three —*present, past,* and *future*—need be considered here. *Present perfect* (=perfect), *past perfect* (=pluperfect), and *future perfect* tenses and the auxiliary verbs used to express them belong to the study of grammar, not the study of style. A complete treatment of tense would include *simple, compound, definite, indefinite, primary, secondary,* and *historical* tenses. The use of the last is mentioned below.

The object of including tense in this series of articles is to point out that the use of the present and past tenses should be uniform throughout an article. Thus, one should not write "The author states" at one place and "The author stated" elsewhere. The verbs *report, mention, describe, write, believe, think,* and a few others are the words in question. Examples of sentences where these verbs commonly appear are:

The author *reports* good results from ...
The author *reported* good results from...
Mohler *describes* the lesions of...
Joss *described* the factors involved...
Schoening *believes* the carriers are...
Eichhorn *believed* the cause is a virus...
Cotton *mentions* live culture vaccination...
Birch *mentioned* promising results from...

Though either past or present tense would answer the purpose in most instances, preference goes to the past tense in referring to more or less recent events published in current literature and to the present tense for references taken from books. *It is important to make this distinction.* Although both speak of a past action, the one (current literature) is past in fact, while the other (books) keeps speaking forever, *e. g.*:

Metzger *mentioned* nutritional causes.
Udall's book *mentions* exposure to...
Jesus Christ *said,* "Father forgive them..."
The Bible *says,* "Thou shalt not covet..."

One should be discreet in the use of verbs expressing *indefinite* action (*tense*), of which *believe* is the most common. Stating that an author *believes* this or that does not provide for a possible change of opinion, and *believed* leaves the impression that the thought is no longer entertained. Other verbs of this category are:

thinks and thought
considers and considered
estimates and estimated
calculates and calculated
conceives and conceived
grants and granted
presumes and presumed
holds and held

All of these words, and there are many others, have a tense value that should not be overlooked. As a rule, they are unintentionally presumptuous except in the other tenses (perfect, past perfect, and future perfect).

Historical Tense.—Telling of past events as if they were occurring at the present time is a practice used by some pathologists in describing postmortem perspectives. That is, the scene filing before the pathologist's eyes, either from the cadaver or slide, is described in the present tense.

The kidneys are pulpy, the liver is dark, the heart is enlarged, the brain is congested, the veins are cuffed, the intestine is ulcerated, etc., etc.

This style is seen in many autopsy reports, interspersed in clinical articles which elsewhere are written in the past tense.

Inasmuch as this throwback from the Greek and Latin grammar is generally disapproved in the best medical literature, an editor, coming upon this sudden shift of tense, is often compelled to rewrite whole paragraphs. When such reports are inserted into a clinical article, the author is advised to make the changes necessary so that the pathologist's diction is consistent with the rest of the manuscript. Write:

The kidneys were pulpy, the liver dark,

> the heart enlarged, the brain congested, the veins cuffed, the intestine ulcerated . . .

for the reason that one is writing about what *was*, not what *is* seen. One thinks of the time at which an article is being written as the *present*, and the events written about as the *past*. This rule places the verbs of a summary or discussion in the present tense, granted that the summary is actually an abridgment of what has just been written:

> A flock of sheep affected with rabies is described.
> The cause is attributed to two stray dogs which bit a number of lambs and escaped.
> The clinical symptoms, characterized by sexual excitement, are described.
> Mention is made of the laboratory technique pursued in demonstrating Negri bodies in Ammon's horn.

It is worth straining a bit to keep in the present tense in summaries. It's a sure preventive for the introduction of new material which the text should have contained. A summary is the story of what the preceding pages embrace and it should never be more.

Future Tense.—Although this is not a lesson in grammar, it is impossible to dodge the use of the two auxiliary verbs *shall* and *will*, since here are two words misused more often than all other verbs combined. An article of sizable length without a single fault in the use of these two five- and four-letter words would be hard to find. Perhaps a good start toward escaping these infelicities would be to avoid the I's and we's, since most of the errors are found in the first person (I shall, we shall, I will, we will), which are by no means interchangeable terms. *Shall* in the first person (I shall go) has no special force, but it does gather considerable strength in the second person (you shall) and the third person (he, she, they, it shall), which is nothing short of a command. *Will*, on the contrary, has its greatest force in the first person (I will go) because it is equivalent to saying "I am determined to go." In the second and third person (you or he will go), it is but a promise made for someone else. Yet "I will", in the sense of volition or willingness, may be weaker than it seems since it may not express the determination intended.

Shall in the past tense (should, as an auxiliary of the infinitive *to be*—should be) is a much abused and overworked verb in medical writing. Its frequent repetition should be (there you are) avoided by reconstructing sentences whenever possible. Accountable for the overuse of this verb is the sameness of the thing described. Here is an example lifted from a catalogue:

> The dose should be 5 cc. and this should be given every forty-eight hours, and this dose should be increased for each injection.

It is amazing how frequently directions of this type are contained in articles submitted for publication. Rewritten, these directions lose neither force nor clarity *i. e.*:

> A dose of 5 cc. given every forty-eight hours and increased with each injection is used.
>
> or
>
> Use a 5-cc. dose every forty-eight hours and increase the amount with each dose.

SUMMARY

1) The past tense is recommended as preferable to the present tense in the writing of articles, and consistency in its use is particularly advocated.

2) Avoiding the so-called historical (present) tense in describing pathological conditions seen *post mortem* is advised.

3) Hints on the proper use of *shall* and *will* are given briefly.

4) The overuse of the past tense of *shall* with variations of *to be* is pointed out and hints on avoiding its too frequent repetition are given.

GENDER

The Question of Common Gender.—Pardon the reminder that there are four genders—masculine, feminine, common, and neuter. In writing drama for living animals, there is never any question as to which/who/what is on the "he" or "she" side of the caste. Excepting rare, unisexual invertebrates, all creatures of the animal kingdom have sex, and often their sex should be designated. Creation arranges its living beings in pairs—male and female. The "sire and dam" coupling of higher life

is universal in the animal world, and since that arrangement is the "plan of perpetuation," no single factor can be more important in the biological sciences. It is, therefore, important in veterinary-medical writing.

When and when not may sex be disregarded in writing about animals is the reason for including an article on gender in this series. That is, in what place may/should the common gender be used? The veterinary writer touches many kinds of living things. Sex distinction becomes apparent in the form of special words, but mostly in the pronouns: *it, its, they, their,* and *them,* of the common and neuter genders, and *he, she, his,* and *her,* the singular nominative and possessive for each of the two sexes. The pronouns of the common and neuter genders, as will be seen, are expressed in precisely the same words, *see:*

It belongs to the genus Felis.
They belong to the genus Capra.
Its wool is long and fine.
Their wool is curly.
Drive *it* through the gate.
What do you think of *them?*

This plebian lesson in simple grammar seems necessary to illustrate that were the antecedents nonliving matter, the same pronouns would apply, *e.g.:*

It is a pebble picked up on the beach.
They were found on the beach.
Its color is red-brown.
Their surface is smooth and brilliant.
Put *it* (or *them*) in your basket.
What will you do with *it* (or *them*)?

But what of the multitude of collective nouns forced upon the writer on animals all the way from kingdom, class, family, order, genus, and species down to the individual animal set apart for study? Shall we say,

it, or *he/she* escaped from the flock;
its, his/her wool was matted with burrs;
so put *it, he/she* in the corral?

Whether sex is disregarded under such a circumstance is less important than use of the same gender throughout. Error creeps in when one writes:

When *it* escaped from the flock, *his/her* wool was matted.
It was a fine Collie, but the owner wanted to have *her* spayed.

All errors of this type (mixing of genders) are not as glaring as in these two examples. As a rule, the pronouns are more widely separated in text material and, therefore, less noticeable to the noneditorial reader.

It seems reasonable to hint, in passing, that in writing about animals above the age of infancy, the sex should be identified as clearly as if writing about an adult human being. In lifting an infant child from its cradle, the common gender (*it*) is used, regardless of whether the sex is known. The same disregard of sex is also permissible for the young of animals. Were one discussing the sex, however, *he* or *she* would seem to be more apropos. In the more mature subjects of higher life, should not the sex always be indicated in conversation or writing? Whether one should speak of the male or female of an insect, worm, or tiny vertebrate as *he* or *she,* we shall leave to the writer's good judgment, insisting only on uniformity, *e.g.:*

The bull's scrotum was swollen and *his* testicles were painful.
The male of Syngamus is attached to the female element and *its* length is 1 cm.

In the first, *its* might be an injustice to the *sahib* of a fine herd of cattle, while the lowly Syngamus would not feel slighted if called an *it.* In other words, while writing *its testicles* instead of *his testicles* is not exactly a *faux pas,* the emphasis is poor in that place, whereas *its length* seems more emphatic in the case of the gape worm.

Summed up to a logical conclusion, the question of common gender becomes a matter of *where* along the chain of living things and *when* along the span of individual life, the veterinary writer becomes obligated to identify the sex of the animal. Here again, there is little to recommend except uniformity, consistency, and good judgment. Arbitrary usage, however, cannot be universally approved for pronouns anteceded by nouns which definitely identify the sex, of which the following defined words are that many examples:

bitch: The adult female of the genus Canis (dog).
barrow: The castrated male of the genus Sus (hog).
boar: The uncastrated adult male of the genus Sus (hog).
buck: The uncastrated adult male of the gen-

era Ovis (sheep) and Capra (goat). The male of the deer, hare, rabbit, but not of the elk and moose.

bull: The uncastrated adult male of the genus Bos (cattle). The male of the elk, moose, whale, porpoise, sea lion, walrus, elephant.

bullock: A young bull, under or around the age of puberty.

capon: A castrated rooster, cockerel, turkey tom, or ostrich.

cob: The male of the domesticated swan.

cock: The male of gallinaceous birds.

cockerel: A young rooster. The young male of the barnyard chicken.

colt: A young horse, ass, mule, zebra, or camel. Among certain horsemen, colt refers only to the uncastrated male from weaning to puberty or below the age of maturity. *See*, filly, gelding, foal.

cow: The adult female of the genus Bos (cattle). The domestic cow. The adult female of the elephant, whale, porpoise, seal, sea lion, walrus, elk, moose. The feminine gender of *bull*, wherever used.

cygnet: The young of the swan (common gender).

dam: The female parent of the genus Equus (horse). In less common usage, the female parent of beasts.

doe: The adult female of the deer.

drake: The adult male of the domestic and wild duck.

ewe: The adult female of the genus Ovis (sheep), domestic and wild.

filly: The young female of the domesticated species of the genus Eguus (horse). A young female horse between the age of weaning and puberty.

foal: The young of the genus Equus (horse)—common gender—between the time of birth and weaning. *See*, filly and colt.

gander: The adult male of the genus Branta (goose) domestic or wild.

gelding: the castrated horse, regardless of age.

gib: The castrated male of *Felis domestica* (cat).

gilt: The young female of *Sus domestica* (hog). A young sow.

gobbler: The adult male of the genus Meleagris (turkey). A tom, or turkey cock.

heifer: The adolescent female of the genus Bos (cattle). The female of domestic cattle from calfhood to the birth of her first calf.

hen: The adult female of domestic and wild fowls.

hind: The female of the red deer, of which the male is a *stag*.

kitten: The young of the genus Felis (cat)—common gender.

mare: The adult female of the genus Equus (horse), mule, ass, zebra.

poulard: A caponized domestic hen.

pullet: An adolescent domestic hen. Feminine of cockerel, *q. v.*

ram: The uncastrated adult male of the genus Ovis (sheep).

rooster: The uncastrated adult male of the domestic chicken.

shote: A young castrated hog (common gender). Also spelled *shoat*.

sire: The male parent of domestic quadrupeds. Masculine of *dam*.

stallion: The entire adult male of the genus Equus (horse) which is kept for breeding purposes.

steer: The castrated adult of domestic cattle.

stud: The entire adult male of the genus Equus (horse), at large or not necessarily used for controlled breeding. A stud horse.

tom: The adult male of the domestic turkey. An uncastrated male of *Felis domestica* (cat).

vixen: The adult female of the fox.

wether: The castrated male of the genus Ovis (sheep).

Among common names for animals which are always common gender whether used for individuals or groups are:

calf	foal
chick	gosling
cub	kid
duckling	kitten
fawn	lamb
fetus	poult
fish	shote

While the sex of these animals is distinguishable, no attempt need be made to do so in writing. Their gender (common) is the same as for groups of animals (cattle, swine, sheep) and they antecede *it*, *its*, *they*, and *them* in their proper agreement. Inasmuch as veterinary literature touches many forms of life, proper usage of gender is not as trivial (nor simple) as it may seem.

The above glossary, like those published in the other articles of this series, contains a panel of words from the long gamut of animal kinds which are used only by experts in their respective fields. In words denoting sex alone, such terms as cob, cygnet, filly, gib, hind, doe, vixen, and many others are missing in general veterinary writing, convenient and expressive as they are. The thought in mind is to bring all such words pertaining to animals into common use. Is one's veterinary education complete without them? In examining veterinarians for licensure, it has been noticed that the younger applicants are not as lacking in this respect as older groups.

Neoplasms of the Bovine Eye

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IN CATTLE, neoplasms occur most frequently in the region of the orbital cavity and usually only one eye is affected. We have never observed a case where both eyes were affected. The Hereford seems to be most susceptible to neoplasms in this region with an occasional case occurring in the Holstein-Friesian. The neoplasm may involve the cornea, the membrane nictitans, one or both eyelids or all of these three structures. If the neoplasm has become extensive, it may be found to involve also the frontal sinus. When a neoplasm has been found affecting the eye or its appendages, it has always been a squamous cell carcinoma.

Another type seen occasionally is an exophthalmus or protrusion of the eyeball. This condition is produced by lymphoid tissue accumulating or developing in the orbital cavity posterior to the eyeball and pushing the eyeball out. These cases develop as the result of lymphocytoma. The exposed tissue becomes dry, inflamed and edematous.

In a series of cases, carcinomas will manifest two different types of growth. In one, the growth is rather fragile and leaf like with a small superficial base of attachment. The other type has an extensive growth with a broad base of attachment that extends deep into the tissue.

Frequently, only the lower eyelid is affected and the carcinoma is attached on the edge. In other cases, the carcinoma involves both eyelids producing a stricture of the eyelids.

The prognosis is favorable in carcinoma of the eye and its appendages when it is operated upon early so that all of the neoplastic tissue can be removed.

Fig. 1—Carcinoma of the Eyelids

Treatment consists in early, complete removal of all affected tissues. If the neoplasm has been permitted to become too extensive, metastases may have occurred to other parts of the body. When the case is presented with the carcinoma having a small superficial base of attachment to the cornea, it may be removed with a sharp scalpel. The wound is then cauterized with

Presented before the Section on Surgery and Obstetrics, at the seventy-ninth annual meeting of the American Veterinary Medical Association, Chicago, Aug. 24-27, 1942.

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silver nitrate. If the carcinoma is attached to the edge of the membrane nictitans only this portion is removed. However, if the neoplasm involves the cartilage, the membrane nictitans is completely removed. In some cases, the carcinoma has a small base of attachment to the lower eyelid. By removing a small portion of the eyelid, the carcinoma can be removed and the eyesight is saved.

In the largest percentage of the cases, it will be necessary to remove the eye and its appendages if all of the neoplastic tissue is removed. The operation may be performed with the animal in the standing position or cast in lateral recumbency.

Fig. 2—Carcinoma of the Membrane Nictitans

Operation—The eyelids are shaved, the skin thoroughly cleansed with carbon tetrachloride and a 1 to 1,000 solution of bichloride of mercury in alcohol is applied to the area. Anesthesia for the operation is obtained by infiltrating the eyelids one half inch from their edge with a 1 per cent solution of procaine hydrochloride. Also 20 cc. of a 2 per cent solution of procaine hydrochloride is infiltrated into the muscles medial to the eyeball.

The edges of the eyelids are sutured together with a continuous suture of tape leaving the ends several inches long. The purpose of this suture is to facilitate the application of traction on the tissues during the dissection. Begin the incision through the eyelids at one of the canthi. It is made one-fourth of an inch from the edge through the skin and subcutaneous tissue to the conjunctiva. The incisions through the two eyelids are united at an equal distance beyond each canthus. In some cases, the eyelids are rather extensively involved and it may be necessary to remove extensive portions of one or both of them. The hemorrhage that occurs should be controlled by the application of forceps to the bleeding blood vessels. By careful dissection, the eyelids are separated from the conjunctiva back to its attachment to the eyeball. With a pair of curved sharp

scissors, each of the eye muscles is severed close to its attachment to the eyeball, the optic nerve is also cut. During the dissection and removal of the eyeball and its appendages, careful palpation is made of the tissue to be sure all of the neoplastic tissue is removed. All of the muscle and fat that is healthy should be left in the orbital cavity.

The hemorrhage that occurs in the depths of the cavity may be controlled during the operation by using a pressure pack of gauze or cotton. In suturing the edges of the eyelids together, best results are usually obtained if wide suture material such as umbilical tape is used. The edges of the eyelids are brought into close apposition by interrupted sutures placed one-fourth of an inch apart. In tying the sutures, care should be taken not to tie them too tight or suture necrosis may develop and delay healing of the wound. At the medial canthus, an opening one inch long is left for drainage and treatment of the cavity. The temporary pack is now taken out and all blood carefully removed; blood left in a

Fig. 3—Exophthalmus of both eyes due to lymphoid tissue. The exposed tissue becomes dry, inflamed, and edematous.

Fig. 4—Carcinoma with a Small Superficial Base of Attachment

wound may become infected and delay healing. An antiseptic such as Bipp, which consists of two parts iodoform, one part bismuth subnitrate, and mineral oil or sulfanilamide to make a soft paste, may be placed in the cavity. To maintain the antiseptic in contact with the tissue and to control the hemorrhage, gauze is packed tightly in the cavity. The gauze should be removed in forty-eight hours. At this time, more of the antiseptic previously used is placed in the wound.

Fig. 5—Carcinoma with a Broad Base of Attachment and Extensive Growth

Aftercare consists in keeping the opening at the medial canthus free of exudate so that there is free drainage. Also the interior of the cavity should be examined frequently for any loose tissue that should be removed. In eight or ten days when the edges of the eyelids should be healed together, the sutures may be removed. If care was taken to remove all of the neoplastic tissue there is little possibility of its recurring.

Reference

Feldman, William H., Neoplasms of Domesticated Animals, W. B. Saunders Company 1932.

The Greatest Mother in the World

The Red Cross drive for funds will be held nationally in March in accordance with a proclamation of President Roosevelt, who has designated this period as "Red Cross Month."

The national goal will be $125,000,000 which is the largest amount of money ever sought in a single campaign for any cause. The Red Cross raised $100,000,000 in 1918 during the first World War when the United States had an army of some 2,000,000 men in a relatively small theater of action. This year's goal, with 7,000,000 men under arms throughout the world, therefore is comparatively modest.

This money will finance *all* Red Cross activities during 1943, the annual Roll Call which during peacetime finances normal Red Cross activities having been merged with the War Fund to conserve manpower for the duration. Barring a great national emergency, therefore, the War Fund will be the only Red Cross appeal this year.

Vaccinal Therapy in Fistulous Withers

A. T. GILYARD, D.V.M., AND RICHARD T. GILYARD, D.V.M.
Waterbury, Connecticut

DURING THE LAST decade, Brucella infection has been repeatedly associated with suppurative disease of the ligamentum nuchae in solipeds. Agglutinins to Brucella antigen are invariably present during some stage of the fistulous process. It is not true, however, that all horses whose serums agglutinate have localized infection, or any other physical indication of brucellosis.

Duff (1937) was able to isolate *Brucella abortus* from 80 per cent of 85 unopened cases of abscesses involving the neck ligament.

Van Der Hoeden (1930) isolated and cultivated the organism in 8 out of 12 samples of pus from fistulous withers and in 1 out of 3 cases of poll evil.

In 1938, Stone (1938) published a résumé of the literature on the subject and a statistical report on serological test of 1,502 samples, which he illustrated in the following table:

TITER	N. Y. (CITY)	N. Y. (RURAL)	CLINIC
Negative	758 (64.6)	110 (56.3)	59 (43.7)
1 : 25	301 (25.7)	49 (25.0)	15 (11.1)
1 : 50	85 (7.2)	23 (11.8)	11 (8.1)
1 : 100	21 (1.8)	4 (2.0)	6 (4.4)
1 : 200	5 (0.4)	4 (2.0)	7 (5.2)
1 : 400	2 (0.2)	2 (1.0)	16 (11.8)
1 : 800	.....	2 (1.0)	4 (2.9)
1 : 1600	.....	.....	5 (3.7)
1 : 3200	.....	.....	6 (4.4)
1 : 6400	.....	1 (0.5)	6 (4.4)
Total	1,172	195	135

The interpretation of titers at this stage of research is perplexing and is of questionable classification value. It does not follow that a high titer forewarns or concurs with localized suppuration. Some horses may carry a high titer over a long period and never show any other symptom. The majority of any selected group of apparently normal horses will not carry agglutinins in their serums. The highest titer determined in the following cases was 1 : 800. Yet other well established cases did not agglutinate above 1 : 50 in the stage of disease at which they were sampled. It is illustrated, however, that the acute, unopened case carries a higher titer than the chronic or the convalescent stage in the same animal as well as in different ones.

The occurrence of fistulous withers in horses cohabiting with cattle is worthy of note. The following cases were seen in an extensive dairy community, in which 15 per cent of the cattle reacted to the initial test.

As early as 1908, Williams commented on a preponderance of rural cases as well as enzoötics.

Stone (1938) has illustrated in the preceding table that only 9.6 per cent of the New York City horses reacted at 1 : 50 or higher, as compared with 25 per cent in the rural horses at the same dilution. All of the strains that he recovered in New York State and typed by the Huddleson dye method were bovine. Fitch (1932) has reported finding both bovine and porcine strains in solipeds.

The focal affinity for the neck ligament in horses is not an altogether unusual behavior for the Brucella organism. Unsightly carpal hygroma or big knees in dairy cattle is another example. Continuous bruising is no doubt a factor, but, on the other hand, such cows are usually positive and the process is essentially a bursitis supported by a honeycomb inner structure, containing a fluid that usually agglutinates in a higher titer than serum from the same patient.

We have observed one case of gigantic, unopened abscess of the withers in a positive cow that also contained a straw-colored fluid that agglutinated in a 1 : 600 dilution.

The serums from two severe shoeboil

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cases agglutinated one at 1 : 25 and the other at 1 : 50. A third shoeboil case showed no agglutination titer. Realizing, of course, that shoeboil is directly caused by habitual trauma, it is possible that it may be made more severe by the coexistence of focal Brucella infection.

In view of the known antibody stimulating properties of avirulent Brucella vaccine in bovines, it was deemed plausible to attempt to treat fistulous withers with vaccine. Strain 19 commercially prepared was employed and although it is not attempted to explain the immunological mechanism involved, the clinical benefits derived seem noteworthy.

CASE 1.—The first case treated was purely an experimental one. It was chronic in a 20-year-old grey gelding, draft type, that had lived on several dairy farms. He also suffered from chronic laminitis and was of little value. There was one median line and one lateral fistulous opening. The discharge was constant and characteristic.

On May 15, 1940, when first seen, serum agglutinated throughout 1 : 100 dilution. Five cc. of Brucella vaccine, strain 19, were injected subcutaneously. The discharge intensely increased on the fourth and fifth days following the injection. Four injections of vaccine were given at intervals of two weeks. Following each injection, the discharge would temporarily increase, but would recede to lesser intensity each time until, after the fourth vaccinal stimulation, it ceased entirely.

Discussion:—This patient, watched for six months after apparent recovery, had no recurrence. He was then destroyed because of old age and chronic lameness.

No anaphylactoid nor local reactions to vaccine were observed, and the patient did light farm work throughout his convalescence. The course of treatment to recovery required approximately two months.

CASE 2.—This patient was a 6-year-old bay gelding, cow pony type, and a "trader's horse." Little was known of the duration of the fistula, but apparently it was quite chronic and had sent the fairly decent pony on his way as a cheap horse.

When first seen Aug. 26, 1940, serum agglutinated throughout a 1 : 50 dilution. There was one median line opening circumscribed by an elevated area of marked induration; the discharge was constant. Vaccine was given on this date; the fistula erupted four days later and promptly receded and remained healed. Two months later, the pony was sold and no further record on him is available.

Discussion:—A recovery serum sample was not taken. The owner described an apparent systemic reaction to vaccine for a period of ten days. The reaction was evinced by lethargy, inappetence, and labored breathing. The point of vaccinal injection did not suppurate.

CASE 3.—On Nov. 15, 1940, a 15-year-old bay gelding, draft type, was seen with a fistula that had been existent about a month. Discharges were copious from a median line and a lateral opening. This horse was from the city, but had been living on a dairy farm for five years.

Serum agglutinated throughout 1 : 400 dilution. Vaccine was injected on the above date. On Dec. 28, 1940, the patient was next seen; an abscess had healed at the point of injection and the fistula was quite inactive; it resembled an ulcer. When questioned, the owner thought that the case had been much worse right after treatment because of an intensification of the discharge. The vaccine was repeated and the case was not seen again until May 2, 1941, at which time it was thoroughly healed and had been so for two or three months. The owner felt that the second treatment had also made the horse much worse, as evidenced by the amount of discharge. A disconcerting impression to say the least, but, at any rate, we were grateful for the observation of the peculiar volcano-like activity of the fistula that seems quite consistently to follow the use of vaccine.

Discussion:—One year later, serum agglutinated completely at 1 : 100 dilution and partially at 1 : 200. The course of treatment to recovery required about three months.

CASE 4.—On Dec. 9, 1940, a 17-year-old chestnut gelding, draft type, was seen for a large, acute, fluctuating swelling at the withers. This horse had spent the working years of his life in the service of a milk company in the city, but for the six months previous to the development of an acute abscess in the neck ligament, he had had a new home on a dairy farm.

The abscess was hot and somewhat painful, and would no doubt have ruptured and become characteristically fistulous in a comparatively short time. Serological agglutination was positive throughout the 1 : 800 dilution.

Vaccine was injected on the above date, and when seen again on Dec. 25, 1940, the owner said, "it had blown up and busted." Two slightly discharging ulcerous areas were still evident. The owner also said that it had broken out on his neck and indicated the point of vaccinal injection where there had been an abscess. Vaccine was repeated, and the fistula was again stimulated to active discharging for three or four days. The case was not seen again until March 1, 1941, at which time it had been completely healed for a month.

Discussion:—When seen approximately one year later, the blood titer was negative in all dilutions, and there had been no recurrence.

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Discussion:—When seen approximately one year later, the blood titer was negative in all dilutions, and there had been no recurrence.

The course of treatment to recovery required about two months.

CASE 5.—This case developed acutely in an 11-year-old grey gelding, saddle bred, that had lived for two years on a beef cattle farm in close intimacy with a herd that was simultaneously undergoing virulent ascending Brucella infection.

The onset of abscess formation in this patient was acute and accompanied by mild sepsis with rupture on the fifth day. When seen Feb. 4, 1941, serum agglutinated throughout a 1 : 800 dilution The discharge was scant and from a single median line opening. The area was painful and indurated.

Five cc. of vaccine were injected on the above date. When seen on Feb. 12, 1941, the point of injection had suppurated, and the activity of the fistula was about the same. The same dose of vaccine was repeated, and following both injections, the owner described a reaction of chills and inappetence. Five days after the second injection, a marked systemic reaction occurred and persisted for twenty-four hours. It was evidenced by fever, rapid hard pulse, and inappetence. Simultaneously with this reaction, the inflammation in the withers receded. The discharge changed from purulent to serous, but persisted. On March 3, 1941, the point of the second vaccinal injection was marked by a circumscribed induration six inches in diameter with a fluctuating center, which ultimately ruptured and discharged inspissated pus, but remained indurated for three months. On March 13, 1941, the discharge was persisting, but remained serous. On Apr. 3, 1941, the fistulous openings were ulcerous in appearance, and the discharge was limited to a scant streaking of the shoulders.

At this point, further vaccinal therapy was thought advisable, but the severity of reactions was thought to be progressive. It was decided to decrease the dose to 0.5 cc., and to inject it intradermally. This procedure was followed in twenty-four hours by a reaction more septicemic than anaphylactic, and on the fourth day thereafter, a volcano-like eruption of the fistula took place, but promptly subsided to limited discharge until Apr. 20, 1941, at which time it again erupted and subsided in two days. On May 2, 1941, the fistula looked like a weeping ulcer with appreciably no local inflammation. This slight discharge continued until Sept. 8, 1941, at which time the fistula closed and remained inactive about one month. On Oct. 13, 1941, two large superficial, fluctuating swellings developed at the point of the withers. Five cc. of vaccine were injected subcutaneously. On Oct. 20, 1941, a large abscess formed at the point of injection, and the abscess at the withers had resorbed 80 per cent. On Nov. 15, 1941, a small superficial abscess at the withers broke and readily drained. The cavity healed quickly, and since that time, through the date of this writing, July, 1942, there has been no activity of the fistula. Serological agglutination was negative in all dilutions on Feb. 4, 1942.

Discussion:—The healed appearance of the withers resembles that of a case on which a radical resection of the neck ligament had been performed. There is a marked depression just anterior to the apex of the vertebral spines incident to the loss of ligament by necrosis.

This patient had excellent supportive care. His shoulders were kept anointed with lard, and he was scraped daily with a silver knife. His stable was fly screened, and his stall was bedded high on the sides with dried sugarcane pulp because, when feeling fresh, he was addicted to rolling.

He was kept well nourished and was frequently walked for exercise. He carries prominent scars from injection abscesses. The course of treatment to recovery required about nine months.

CASE 6.—This case was chronic in an 18- to 20-year-old black gelding, draft type, with a limited history except that he had been living on dairy farms all his life and had been acquired by his present owner to butcher. It was not known how long he had been fistulous. The case was first seen March 17, 1941. There were two lateral openings discharging abundantly. The patient was thin, undernourished, and devitalized.

A serum sample agglutinated throughout 1 : 100 dilution and partially at 1 : 200. Five cc. of vaccine were given subcutaneously, and the case was isolated and more or less ignored. When seen again Apr. 2, 1941, the discharge had practically stopped, and an abscess had broken at the point of injection. The vaccine was repeated. On Apr. 10, 1941, the withers had healed, and the second vaccinal injection was abscessing. The case was not observed sufficiently to determine whether the amount of discharge had increased after treatment.

Discussions—This case remained healed, gained weight, and was put to work. On May 15, 1941, the fistula became active again, and the owner, feeling discouraged, destroyed the animal without further consultation. We would have preferred to repeat the vaccine and to carry the case through another vaccinal stimulation if circumstances had permitted.

CASE 7.—This case was seen Dec. 8, 1941, in a 6-year-old chestnut gelding, draft type. The owner reported that the fistula had been active about a month. He had had the horse two years, during which time it had lived with dairy cows, but it had come from the west. There was considerable indurated swelling, and the lesion drained from two lateral openings. Serum agglutinated at 1 : 100 dilution.

On the above date, 5 cc. of vaccine were injected, and on Dec. 11, 1941, much eruptive activity was apparent. The amount of dis-

charge was greatly increased, and the point of injection was suppurating. Vaccine was repeated, and the case was not seen again until Jan. 18, 1942, at which time there was considerably less induration in the area, and one side had ceased to discharge. The other side was discharging a scant amount intermittently. On Feb. 2, 1942, the owner reported no discharge for several days. On March 7, 1942, the lesion broke open and discharged lightly for approximately two weeks, after which it healed over and has remained inactive through the date of this writing.

Discussion:—The course of treatment to recovery required slightly less than four months. No recovery serum sample was taken.

CASE 8.—On Nov. 14, 1941, a 15-year-old bay gelding, draft type, living with a small dairy herd, was examined out of curiosity because of two football-size abscesses, one on each side of the withers. The abscesses had developed over a year previously and had never broken open nor caused any apparent discomfort.

Serum agglutinated throughout a 1 : 800 dilution and partially at 1 : 1,200. Aspirated fluid agglutinated at 1 : 1,200 dilution and contained *Br. arbortus*. From the standpoint of jurisprudence, it was deemed inadvisable to treat this horse with vaccine until such a time as the abscess broke and chronic fistulous discharge began. The owner was not particularly concerned, and it is to be expected that vaccine would activate the lesion causing it to erupt violently and consequently be very much worse before it was better. The case was left with the impression that if and when it became fistulous, vaccinal treatment would be initiated.

SUMMARY

1) There is an abundance of evidence to involve *Brucella abortus* in the etiology of fistulous withers in horses.

2) In the absence of gross pathology, serum titer alone is not a means of classification.

3) Seven cases of fistulous withers, varying from acute to chronic stages, were treated with commercial Brucella vaccine strain 19.

4) Six cases made permanent recoveries, and one case under treatment was destroyed prior to a time at which an opinion of its progress might have been justified.

5) The average period of time under treatment was approximately 3½ months.

6) The average number of vaccinal injections per individual was three.

7) All of these cases occurred in geldings of an average age of 13 to 14 years.

8) No auxilliary surgical or medicinal treatment was employed.

CONCLUSIONS

1) Brucella vaccine appears to have a fulminating effect on the fistulous process. Local and systemic reactions were also observed.

2) After repeated vaccinal stimulation, the process permanently subsided to apparent recovery in six of seven cases so treated.

3) Further attempts to treat fistulous withers with Brucella vaccine strain 19 appear to be justified.

Virus Abortion in Mares

The disease may strike as early as the sixth month of gestation, but usually occurs during the eighth, ninth, and tenth month. There is no previous warning of its presence. The morbidity varies from 10 to 85 per cent, one abortion following the other at irregular intervals varying from a few days to sixty days. The disease is highly contagious and leaves no immunity to subsequent attacks one to five years later in the same mares. Necrotic, pin-sized, white to yellow areas between Glisson's capsule and the substance of the fetal liver are characteristic postmortem findings. Areas of hepatic degeneration were found in 83.3 per cent of the fetal carcasses examined. The reservoir of the virus is not known.

Good results have been obtained from liver vaccine. Immune serum was less encouraging. Mares that abort during the early months of gestation should not be bred until after the end of the regular term and others not for sixty to ninety days after aborting.—*W. W. Dimock, P. R. Edwards, and D. W. Bruner, University of Kentucky, from Experiment Station Bulletin 426.*

The laboratories of the University of Moscow have discovered a method of producing large quantities of thrombin which stops bleeding within a few seconds when applied to the bleeding spot.—*Science.*

Modern Equipment in American Veterinary Colleges

The pictures reproduced herewith represent the type of equipment employed in teaching the practice of veterinary medicine and surgery at the College of Veterinary Medicine, Ohio State University. The pictures were furnished by W. F. Guard, professor of surgery and clinics, who points out the advantages of the architecture of the improved operating table shown. The solid, hinged doors in front of and behind the animal overcome the objectionable dangling of its legs when lifted from the floor and shield patient and personnel from injury. The body belts and the hobbling trappings are under hydraulic control. Other than the fact that buffaloes are not numerous as surgical subjects, no importance is attached to the fact that a bison happened to be the patient when the photographs were taken.

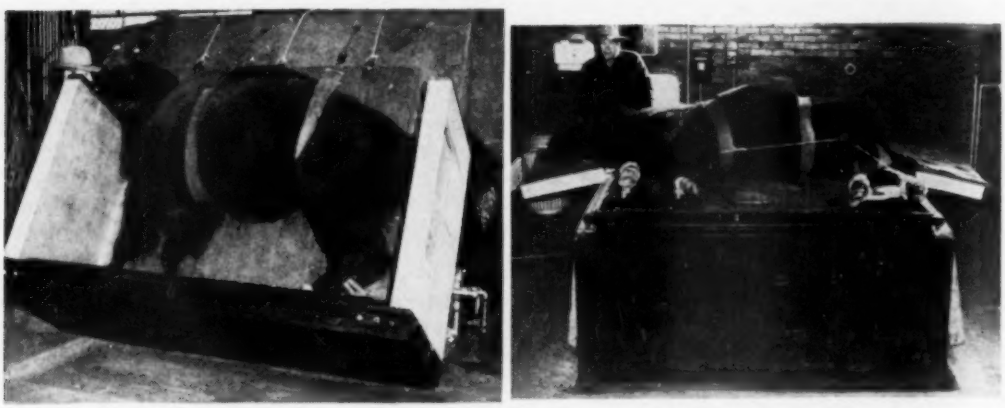

Fig. 1 and 2.—Operating table in the surgery, College of Veterinary Medicine, Ohio State University. Left: Showing hinged doors protecting patient and personnel against injury from swinging legs. The patient is a buffalo. Right: Showing patient in the horizontal position, with head resting on a hinged door for that purpose.

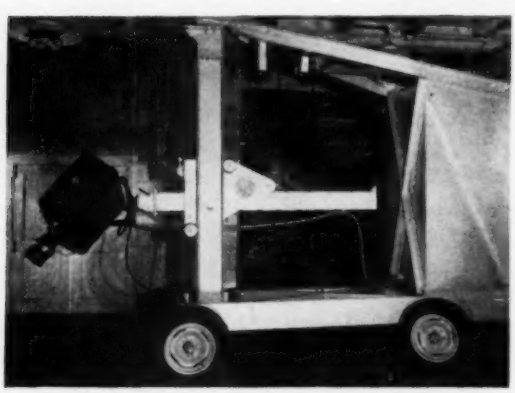

Fig. 3.—The portable x-ray apparatus employed in the surgery.

The portable x-ray machine occupies the same room as the operating table and is used on large as well as small animals for both photographic and therapeutic purposes.

Glass Suture Material

Glass thread for suturing wounds is the newest thing in surgery. Features: strong, knots well, germ proof, no action on the tissues nor *vice versa*, stays put, and causes no irritation. Glass sutures have remained unchanged in the tissues for two years.—*Scholz and Mountjoy, St. Louis, quoted in Pathfinder.*

In Scotland, dehorning cattle over a month old without the use of an anesthetic is punishable by a fine of $25 to $125 and imprisonment for a period of three months for a subsequent offense.—*From Our Dumb Animals.*

CLINICAL DATA

It is said that if land were fertilized on the basis of facts now known, caries would become a rare disease.

In blood testing 3,318 herds in 51 counties in New York for the purpose of launching calfhood vaccination, 70 per cent of the herds were found to contain various percentages of reactors. The number of reactors ranged from 32 to 85 per cent.

The vagary called *resistance to disease* appears to be closely related to the intake and the utilization of vitamins A and C. Although other factors are not to be excluded, these are never to be set aside with impunity in speaking of *resistance.*

The cheapest grade of sulfur sprinkled in the poultry housing and over nestings of the chicken mite will control that pest, according to Emmel of the Florida station. It may also be dusted upon the chickens. The success of the treatment depends upon getting the sulfur in contact with the mites.

Although the spermatozoa of stored semen have a high percentage of motility, conceptions from its use are significantly lower than from fresh semen. A total of 931 cows inseminated is the basis of the conclusion.—*Underbjerg, Davis, and Spangler, University of Nebraska, Journal of Dairy Science.*

Tyrosinase, an enzyme of mushrooms, is said to relieve hypertension. No lowering of blood pressure was derived from feeding mushrooms to animals. The extract must be injected to obtain that result.

The local use of sulfanilamide on surgical wounds would be a grave misfortune were it to lead to careless aseptic technique.

The agricultural experiment stations of Texas have proved beyond doubt that feeding sulfur to goats does not kill body lice as has been previously claimed. Goats fed sulfur in sufficient quantity to finally kill them, still harbored lively lice.

Trials carried out at the University of California proved that phenothiazine mixed with salt, 1 : 15, and placed in troughs for free access is a successful treatment for gastric strongylosis of lambs. A fresh supply is provided every three or four days.

At the Ohio Agricultural Experiment Station, the incidence of calf pneumonia was reduced from 46.2 per cent to 20 per cent and the mortality from 75 per cent to 7 per cent when sufficient vitamin A was added to the feed. The requirement to prevent pneumonia was 15,000 to 20,000 units of vitamin A per day.

It is, perhaps, not new but worth repeating that the government (WPB) forbids the sale, delivery, or use of quinine and the other cinchona alkaloids and salts for any purpose other than the treatment of malaria. Quinine and urea hydrochloride and quinadine are not included in the restriction, nor are the U.S.P.XII products totaquine, quinacrine, and pamaquine.

Spermatozoa of bulls are more resistant to temperature shock when suspended in egg yolk buffer than when in plain buffer solutions or in semen alone.—*Lardy and Phillips, University of Wisconsin in Journal of Animal Science, November, 1942.*

Acute Canine Tularemia: A Case Report

W. M. COFFEE, D.V.M., and JOHN MILLER, D.V.M.

La Center, Kentucky

UNTIL RECENTLY, it has been believed generally that the canine species is resistant to tularemia by natural infection. This disease was not considered to be important from a clinical standpoint. Somewhat over a year ago, this picture began to change. Ey and Daniels of the Ohio Department of Health in an interesting article[1] proved that dogs can be infected under conditions of natural exposure and that they show high agglutination titers to *Pasteurella tularensis*. They concluded that dogs were mildly susceptible to the disease. This suggested that the clinical problem may be confronting the practitioner.

While the article cited is excellent, it unfortunately does not describe the symptoms exhibited by the affected dogs and, to our knowledge, there is no such description in the literature. We feel, therefore, that a description of a case of tularemia diagnosed in our clinic may be of value and possibly bring to light other cases which will add to the knowledge of the symptoms of this disease in dogs.

History.—A male Pointer, about 5 years old, was presented to us November 15. The animal came from a rural district of southern Illinois, where he had been allowed free range. He had shown malaise and a progressive loss of weight for almost a month. During this time, he had been examined by two veterinarians, but no diagnosis was made.

Three days before arriving at our clinic, small nodular swellings appeared under the skin. They were hard, and when about the size of a hickory nut, they would point and drain. The day before being presented, the left eye of the dog began to swell and become painful. The appetite was fair and eliminations were said to be normal.

Physical Examination.—Examination revealed this clinical picture: temperature 102 F., pulse and respiration normal, thin but in good spirits. There were three nodules on the right thoracic wall, two of which had broken and drained, and one which we drained. It contained a thick, tenacious, reddish, amber pus with little necrotic dèbris. The left hind leg was swollen from stifle to toe. A nodule had burst on the lateral surface of the outside toe of this foot. There were swellings in the region of the popliteal lymph glands of both limbs. These were hard, deep nodules.

The left eyeball was enlarged to half again its normal size and the cornea was opaque. The sclera was intensely congested, and there were three raised, hemorrhagic foci on the dorsal sclero-corneal margin. The eye was very painful, discharging serous pus.

The dog was hospitalized without a diagnosis. Judgment was suspended until the animal could be more thoroughly examined.

Diagnosis.—In attempting to diagnose the case, we first considered empyemia, but a careful physical check disclosed no focal infection. It was observed that the swellings were occurring along the course of the superficial lymphatics, but due to their irregular size and occurrence, and their tendency to burst, drain, and disappear, along with the characteristic nature of the pus, we could not consider it leucemia.[2]

Knowing that a case of tularemia had been diagnosed and proved by Ey and Daniels, and as the abscess formation suggested the lesions seen in wild rabbits, we considered the possibility that the disease was tularemia. Although there was no history of contact with wild rabbits, the opportunity existed. Furthermore, we knew that ticks, fleas, mosquitoes, and flies had been convicted as vectors of this disease.[3] While we had neither a tularensis antigen nor facilities for cultural work, we knew there

[1]Ey, L. F., and Daniels, R. E.: Tularemia in Dogs. J.A.M.A., *117*, (Dec. 1941): 2071.

[2]Brumley, O. V.: Diseases of the Small Domestic Animals, 2nd ed. Lea and Febiger, 1931, p. 309.

[3]Kelser, R. A.: Manual of Veterinary Bacteriology, 3rd ed. Williams and Wilkins Co., 1938, p. 213.

was a cross agglutination between *Brucella abortus* and *P. tularensis*.[4] Therefore, a blood sample was taken, the serum obtained and tested with *Br. abortus* rapid plate antigen. The result was a positive reaction up to and including dilutions of 1 : 200. This reaction was definite, but not typical of a brucellosis agglutination in that the clumps were finer. It might be noted here that there was no possibility of clumping of erythrocytes, as the serum sample was clear yellow. We felt that this reaction, in association with the clinical picture, justified a diagnosis of tularemia.

Clinical Course.—The clinical course of the disease was observed for a period of two weeks. The day after admittance, a nodule appeared and burst on the forehead about half way between the nuchal crest and the left eye. The serous discharge became mucopurulent from the affected eye. Some cloudiness of the cornea of the right eye appeared. As the case progressed, the left eye developed ulcers at the site of the aforementioned hemorrhaghic foci. Under treatment, the painfulness and swelling began to leave this eye the seventh day, and by the ninth day it was normal in size, but was still opaque at the time of discharge of the animal. The right eye failed to follow the course of the left and cleared up two days after treatment was started. The mucopurulent discharge continued throughout our observation.

The lesions of the right thoracic wall dried up following drainage and healed without suppuration, but thickened areas of scar tissue were still in evidence upon discharge. On the fourth day, the right popliteal lymph gland burst and drained, with the usual characteristic pus. The left popliteal gland was enlarged and firm, but did not burst while under our observation. At this time, it was found that the superficial inguinal lymph glands were greatly enlarged and firm, and although this condition persisted throughout hospitalization, there seemed little likelihood that they would drain. On the twelfth day, the submaxillary lymph glands became enlarged and at the time of discharge they gave a wattle-like appearance.

We feel that our diagnosis of tularemia is further borne out by the enlargement of

Fig. 1.—Top, general condition; center, left hind leg showing swelling from stifle to toe; bottom, left eyeball enlargement.

the lymph glands with their subsequent suppuration as described above. We did not find a primary lesion as described by Kava-

[4] *Ibid.*: p. 215.

naugh,[5] which appears as a painful papule, later breaking down and liberating a necrotic core and leaving an ulcer. This, however, in no way indicates that such a lesion was not present at the onset of the disease.

The right hind limb was stocked from the foot to the stifle joint upon admittance and remained so throughout hospitalization, although it would vary as to degree.

General symptoms throughout this period of observation were as follows. Appetite was usually good, but occasional inappetence was noted. Bowel movements were normal throughout this period. Urination was regular, with large quantities voided. Temperature was never over 102 F. while under our care. Recurrent chills were noted in the animal throughout observation. They conformed in occurrence with evidences of muscular soreness, sometimes to the extent that it was almost impossible to get the animal to move out of his cage. At other times, he would move readily, but always stiffly.

Treatment.—On the day of entrance, immediately after drawing our blood sample, the animal was injected with 0.66 Gm. neosalvarsan. The dose was repeated on the third and sixth days. As far as we could determine, this line of treatment did nothing to alter the course of the disease.

An aqueous solution of zephiran, 1 to 2,000, was applied to the eyes twice daily for five days. This seemed to relieve the condition to some extent, as the right eye cleared up and the left eye improved, although not to the extent desired. After the fifth day of treatment, yellow mercuric oxide ointment was substituted, as the intense inflammatory symptoms had subsided.

On the ninth day, when it became apparent that neosalvarsan was producing no results, we began administration of sulfanilamide and sodium bicarbonate, 5 gr. of each, three times a day. Five days later, when the dog was sent home, we could not truthfully say that any benefit had been obtained. We did, however, dispense two weeks treatment of this type, along with advice as to care in handling the dog and as to diet.

The result of our treatment is borne out by the experience of the medical profession in human cases, where results are varied and contradictory.[6]

[5]Kavanaugh, C. N.: Tularemia: Report of Seven Cases. Kentucky State Medical Journal, July, 1927.

CONCLUSIONS

1) It is safe to assume that this clinical picture is one of oculo-glandular tularemia in the dog.

2) The dog can have severe tularemia acquired from natural infection.

3) Neither arsenicals nor sulfanilamide altered the course of the disease in this particular case.

4) We feel that a report of this case may bring to light instances of similar symptomatology in other dogs with the resultant opportunity for increased knowledge concerning the incidence and course of this disease in the dog.

[6]Beckman, Harry: Treatment in General Practice, 4th ed. W. B. Saunders and Co., 1942, p. 286.

Vitamin-Mineral Therapy in Animals

In a study of 400 consecutive patients at the Stanford University Hospital, Krupp (*J.A.M.A.*, Aug. 22, 1942, pp. 1475-1479) found that one-fourth of them showed definite signs of vitamin deficiency, and but 3.1 per cent had a recognizable clinical entity. The investigation seems to be proof that the preponderance of avitaminoses go on untouched by the hand of medical science. Studies in the veterinary field indicate that the same situation obtains in animal production. Clinical nutritional diseases in animals, of which quite a few are now recognized in the routine of veterinary practice, and the vitamin or mineral deficiencies leading to them are yet to be brought together as a unique malady. That is, means of detecting the early symptoms must be found before vitamin-mineral therapy attains the exactitude of scientific medicine. Meanwhile, empiricism based upon the facts coming to light is justified where reason prevails, instead of the blunderbus type of therapeutics characteristic of the every-man-his-own-stock-doctor kind of veterinary practice.

Rabies in Sheep

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ON THE MORNING of Aug. 9, 1942, four dogs were found attacking a flock of 65 lambs belonging to West Virginia University. No lambs had been killed, but an examination of the flock showed a number of lambs bleeding from their noses, lips, mouths, ears or cheeks. Six of the lambs were so severely lacerated that the wounds were given treatment.

Two of the dogs were killed in the pasture, and two escaped temporarily. One of the 2 dogs that escaped was shot the following day. None of these 3 dogs was examined for rabies.

In the afternoon of the day of the attack on the lambs, one of the dogs bit a cow on a farm located between two and three miles distant from the lamb pasture. The cow was bitten through the lip and nostril. The dog was captured on this farm, returned to the owner and placed in confinement. On August 10, a veterinarian was called to see this dog and the report, *suspect rabies*, was made. This dog died on August 13, after showing the usual clinical symptoms of rabies.

Examination of the brain of this dog showed typical Negri bodies in abundance. Diagnosis rabies.

On the morning of August 29, the owner of the cow that had been bitten on August 9, reported that the cow was showing changes from the normal. The following day, the owner again reported that the cow was about to wreck his barn when anyone approached. This cow was destroyed without examination of the brain for the presence of Negri bodies.

A visit, on August 28, to the University farm where the lambs had been bitten, revealed the fact that the lamb most severely bitten on August 9, had died the previous day. This lamb was a wether, and the farm superintendent reported that for two days it had not eaten or taken water and had acted like an amorous ram, and that the flock mates had trampled him to death. No examination of the brain of this lamb for the presence of Negri bodies was made owing to postmortem changes.

Examination of the flock showed 3 ewe lambs to be nervous, restless, occasionally digging the bedding and in great sexual excitement, showing male characteristics in this respect. They would approach their flock mates with the head extending along the side and make the sound similar to that made by a ram approaching a ewe in estrus. They mounted their flock mates promiscuously. These 3 lambs showed partially healed wounds on the nose and lips. They were separated from the flock, and lamb 17 died on August 29. The brain was positive for Negri bodies. Diagnosis rabies.

The other 2 lambs, 20 and 99, died on August 30. Examination of their brains was positive for Negri bodies. Diagnosis rabies.

On August 30, 2 more lambs, showing symptoms of rabies, were removed from the flock, both of which died September 1. Examination of their brains was positive for Negri bodies. Diagnosis rabies.

From September 1 to September 5, 13 lambs were removed from the flock on account of symptoms of rabies, and destroyed or allowed to die naturally from the disease. Of this group only one brain was examined for Negri bodies, and this one was positive.

No new cases occurred until September 10, when lamb 26 was removed from the flock. This lamb died September 14. The brain was positive for Negri bodies. Diagnosis rabies.

On September 25, lamb 49 showed symptoms and was removed from the flock. Death occurred on September 30. Brain positive for Negri bodies. Diagnosis

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rabies. No new cases have occurred since September 25.

SUMMARY

In all, 21 lambs died of rabies in a flock of 65 head that had been attacked by 4 dogs. Whether more than one of these dogs was rabid was not determined. However, 1 of the 4 dogs was proven a positive case of rabies.

All of the affected lambs showed inability or no desire to eat or drink, nervousness, restlessness, great sexual excitement (wethers, ewes or rams showed male characteristics in this respect), and a vacant stare in the eyes. Six of the lambs showed aggressiveness, butted their pen mates and butted the pen wall or partition in response to movement or noise. Almost continuous bleating was shown by 3 of the lambs from the time of well advanced symptoms to the time of prostration. One or 2 of the lambs showed a tendency to gnaw the boards of the pen. Drooling of saliva was not noted, but the lips and hair about the mouth was usually moist. Death usually occurred from one to two hours after the lambs became prostrate. The time from first visible symptoms to death varied from two to six days.

Negri bodies were not numerous but definite in these lambs. The number present in the individual brains examined was even less than ordinarily found in the brains of cattle dead of rabies.

The time elapsing between the exposure to the dogs and the death of the first and last lamb, was eighteen and fifty-two days respectively. The time between the first and last death was thirty-four days. All but 2 of the lambs died within a period of twelve days following the first death. The period of incubation for the first lamb was fifteen or sixteen days, and for the last lamb fifty-two days, if this last lamb developed the disease from the bite of the dog.

There is the possibility that lambs 26 and 49 could have become infected from their flock mates, but there is also the likelihood that these 2 lambs were bitten on some remote part of the body, accounting for the longer period of incubation.

Considering the conditions surrounding this flock of lambs, it is quite improbable that there was any spread of rabies from infected lambs to other lambs.

Brucellosis or Bang's Disease Control

This is war. Healthy herds are needed to supply the increased demand for meats and dairy products in the war emergency. Brucellosis may cause:

a) abortion or weak calves;
b) retained afterbirths, breeding difficulties, and udder diseases;
c) decreased milk production.

Calves from reactor cows can be raised free from the disease if removed from the contaminated premises. Many clean herds have been built with calves from reacting cows. Calves 8 to 10 months of age or older, and particularly pregnant heifers, are highly susceptible and should not be exposed to infected cattle.

Cows free from Bang's disease may abort from other diseases.

The bull is not usually an important factor in the spread of brucellosis—most animals become infected from contaminated food and water, or from licking the discharges or the calves from infected cows.

Human beings may contract brucellosis from cattle in the form of undulant fever.

Three plans of control.—There are three federal-state programs based upon the testing of herds:

1) slaughter of reactors;
2) slaughter of reactors and vaccination of calves; and
3) retention of reactors and vaccination of calves.

The owner may select any one of these plans. No indemnity is paid.

Blood testing.—Blood testing is accurate and is the basis of all control programs.

Slaughtering.—Reactors can be slaughtered. High-producing, normally breeding reactors may be retained in the herd. Complete or temporary isolation of reactors is recommended. Complete isolation involves keeping reactors on separate farms. Tem-

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From the Extension Service in Agriculture and Home Economics and Animal Pathology and Hygiene Department, University of Illinois.

porary isolation includes removal of reacting animals from the herd at calving time.

Sanitation.—The backbone of brucellosis control is good cattle management. Clean, dry, well-ventilated barns, clean lots, and balanced rations, together with sunlight and fresh air, will do much to check the spread of the disease. Bang's disease germs located in fields may be promptly killed by the sunlight, but infection in dark, poorly ventilated, and unclean stables may live for months. Each herd represents a separate problem.

Calfhood vaccination.—Under the federal-state plan, vaccination of infected herds is an adjunct to testing and sanitation. State regulations provide for the vaccination of calves between the ages of 4 and 8 months under permit of the chief veterinarian of the State Department of Agriculture at Springfield.

Calfhood vaccination is optional with the owner and ordinarily is not recommended in clean herds; it does not replace blood testing and sanitation and, if improperly used, may do more harm than good. The vaccine contains live germs, and many veterinarians refuse to vaccinate calves in clean herds even though they may be requested to do so by the owner. Vaccination reactors cannot be distinguished from reactors to natural disease.

Cows should not be vaccinated until more information is available from experimental work. A high percentage of calves vaccinated between the ages of 4 and 8 months become negative to the blood test before breeding age; mature animals often fail to become negative following vaccination.

Fungus Dermatitis in a Dog

That the dog is a host for *Blastomyces dermatitidis* was revealed by a case reported by Forshay and Madden[1] of Cincinnati, Ohio. The suspected sources of the fungus isolated in human cases were surface soil, grasses, thorns and branches of plants, and rotting wood. But few cases have been reported in animals.

[1]Forshay, Lee, M. D., Department of Bacteriology, University of Cincinnati, and Madden, A. C., D.V.M., Madeira, Ohio: The American Journal of Tropical Medicine, 22, (Sept. 1942): 565-569.

The subject of this report was a Pointer pup born Jan. 2, 1940, which became a promising gun dog at the trials of 1940 and 1941. In January, 1942, it became ill and covered with lumps, lost weight, with swelling about the head, and became uneasy and restless. The weight dropped from 60 to 28 pounds, and abscesses, from pea- to lemon-size, developed from muzzle to tail,

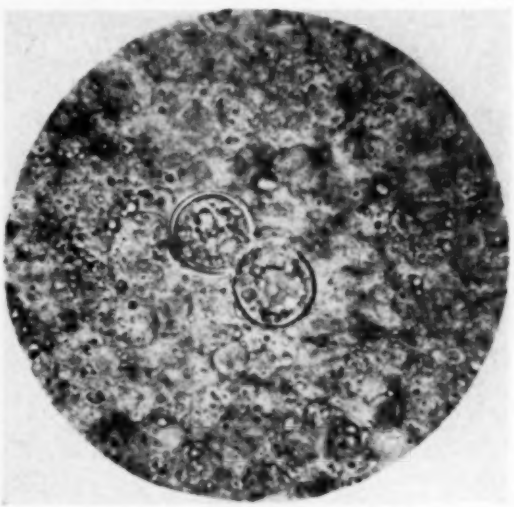

Fig. 1—Blastomycetes from the pus of a subcutaneous abscess. Reduced from x1,125. Unstained sealed wet preparation.

particularly numerous along the dorso-lateral aspect of the body. The abscesses extended down to the feet.

Examination of pus removed aseptically from the pustules antemortem disclosed the presence of budding organisms which were identified as *Bl. dermatitidis* in pure cultures. The morphological and serological identity of the organism with that of the human strain was confirmed by Dr. Donald S. Martin, of Duke University, to whom cultures were submitted for examination.

No other dogs of the owner's household have shown any cutaneous trouble, or other disease, though two months have passed since the dog died. The authors believe this to be the first case of generalized blastomycosis to be reported in dogs.

An excellent way to help lose the war is to focus attention on the crazy notions afloat about the post-war world.

Preservation of Dried Equine Encephalomyelitis Virus in Vacuum-Sealed Tubes

The infectivity of equine encephalomyelitis virus held for as long as a year in the refrigerator in the form of phosphorus-pentoxide-dried chicken embryo tissue in vacuum-sealed tubes has been reported.[1] The purpose of this note is to report later tests of two of the same preparations previously reported upon.

After 8 intracerebral passages in guinea pigs and 114 passages in chicken embryos, a strain of western-type equine encephalomyelitis virus, isolated in 1937 from an Iowa case, was dried in embryo tissue over phosphorus pentoxide (P_2O_5) in a vacuum jar and, after desiccation, was sealed in vacuum tubes May 26, 1939. An eastern-type encephalomyelitis virus, isolated in 1937 from a South Carolina case, handled likewise after 58 intracerebral passages in guinea pigs and 8 passages in embryos, was sealed in vacuum tubes Nov. 27, 1939.

The western strain of virus was injected intracerebrally into guinea pigs after three years and seven months' storage in the refrigerator and found to be fully active. The eastern strain of virus was injected intracerebrally into guinea pigs after storage for three years and one month in the refrigerator and likewise found to be fully virulent. Since other tubes of the 2 viruses are on hand, it is planned to test these at later intervals to determine how long American strains of equine encephalomyelitis viruses will survive under these conditions. In this connection, attention is called to a report that the virus of Borna disease has been found to remain fully virulent for seven years in the form of brain tissue dried *in vacuo* over calcium chloride and stored in a cool, dark place.[2]

From the Pathological Division, U. S. Bureau of Animal Industry, Agricultural Research Administration, Washington, D. C.

[1]Shahan, M. S., Eichorn, E. A.: Studies of Chick-Embryo Propagated Equine Encephalomyelitis Virus and Vaccine: Antigenicity and Preservation. Amer. Jour. Vet. Res., *2*, (1941): 218-220.

[2]Schwarzmaier, E.: Die Haltbarkeit des über Chlorkalzium im Vakuum getrockneten Bornavirus. Berl.-Münch. tierärztl. Wschr. (Mar. 21, 1941): 143-144, Abst. in Vet. Bull. *12* (12): 581.

M. S. Shahan, D.V.M., U.S. Bureau of Animal Industry, Washington, D. C.

Distemperoid Virus in Canine Distemper Control

The high incidence of distemper among their foxes, sometimes amounting to 40 per cent of total births, led Fromm Brothers, Wisconsin's largest fur farmers, to launch and carry out extensive investigations on plans of artificial immunization. Appropriations of more than a million dollars were expended in the investigation under the direction of R. G. Green, Medical School, University of Minnesota, who was chosen in 1924 to undertake the study.

By 1935, as reports state, the result was the production of a live canine distemper virus, modified by 50 to 60 passages through the ferret (*Pultorius furgo*), member of the weasel family that is well known for its susceptibility to that disease.

The modified virus, now offered to the veterinary profession under the name of Distemperoid Virus (Green Method—Ferret Origin), has been used on over half a million foxes since 1935 and on a sizable number of dogs in recent months. Granted that dogs will respond as obediently as foxes, the new vaccine may be pronounced a welcome addition to the field of veterinary medicine and, perhaps, a worth while innovation in the science of immunology of virus diseases.

The modification of a virus from pathogen to antigen by numerous passages through susceptible laboratory animals is an achievement to credit exclusively to Dr. Green so far as we know, and to a private subsidy which certainly has no parallel in medical research.

One of the perturbing nutritional problems of the wartorn countries is the difficulty of maintaining a sufficient supply of vitamin C.—*From Nutritional Reviews.*

Rifle your book shelves for good books to send to the boys in the armed forces. The better the book, the better the gift.

NUTRITION

MATERIAL FURNISHED BY THE COMMITTEE ON NUTRITION

Wartime Problems in Poultry and Animal Nutrition

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THE TITLE OF THIS paper could well have been "How Are We Going To Feed Farm Animals and Birds in 1943?" The production goals as set by Secretary of Agriculture Wickard for meat, milk, and eggs are somewhat staggering when compared to the all time high production figures for 1942. The 1943 production goals call for 122 billion pounds of milk. In 1942, 120 billion pounds were produced. The 1943 goal calls for much less than the amounts needed, but presumably took the labor situation on the dairy farm into consideration.

The 1943 goals call for 25 billion, 700 million pounds of meat, including beef, veal, pork, lamb, and mutton. This is 16 per cent more than was produced in 1942. Approximately 25 per cent of the total will be required for lend-lease purposes. The pork goal calls for farrowing of pigs totaling 121 million head, or a 15 per cent increase over the record pig crop of 1942.

Four billion pounds of chicken and 560 million pounds of turkey, or 28 per cent and 15 per cent respectively over the 1942 production, are requested. The egg production goal calls for an 8 per cent increase with emphasis on larger production per layer.

The American farmer is doing his dead level best to attain or exceed these goals. To accomplish his aim he needs feed and lots of it.

Our country today is facing a serious feed shortage, and livestock production goals are in danger of bogging down unless something can be done to increase the available supply of feeding ingredients, particularly as regards protein concentrates.

Carbohydrates.—The country, fortunately, has a fairly comfortable supply of carbohydrates in the form of cereal grains such as corn, oats, wheat, and barley. These cereal grains will not, however, do an efficient or economical job of feeding livestock unless supplemented with proteins, vitamins, and minerals. It is a well-established fact that it takes about 12 bushels of corn to produce 100 pounds of pork when corn is the only feed given to hogs. If corn, however, is supplemented with a good quality protein, properly vitaminized and mineralized, the 100 pounds of pork can be produced with approximately 6 bushels of corn or less and 40 to 50 pounds of the protein supplement. In other words, a small quantity of protein supplement will save about 6 bushels of corn and will also aid materially in getting the hogs to market early.

The value of proteins, minerals, and vitamins as supplements to farm grains is just as important for poultry and other classes of livestock as it is for swine.

Molasses, a highly regarded carbohydrate feed, is restricted for feeding to farm animals by a government order. This order was put into effect because of the need for molasses in the war time alcohol program.

Fats.—Due to the war needs for fat, many ingredients in livestock feeds are being processed today in such a manner as to remove more fat than was the custom previously. This means that livestock and poultry may be getting less fat in their rations than before. Fat guarantees of

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mixed feeds in some instances have been reduced, but it is believed that this reduction, made because of war needs, will not have an adverse nutritional effect.

Minerals.—The critical lack of mineral ingredients is limited to the supply of bone meal. No serious shortage of other commonly used mineral ingredients is apparent. Bone meal, according to estimates prepared by competent people making a study of the situation, will be short by 175,000 tons of the amount needed for livestock feeding.

Vitamins.—The country's supply of vitamins, while inadequate in some respects, is not as critical as some other ingredients.

The use of vitamin A from fish and fish-liver oils is restricted under the War Production Board's order L-40. The order allows for ample nutritional use of the vitamin, but controls wastage.

Vitamin A (carotene) from plant sources, particularly alfalfa, is inadequate to meet the country's needs, primarily because weather conditions interfered greatly with the harvesting of the 1942 alfalfa crop. It is estimated that the available supply is approximately 98,000 tons short of the country's needs. Farmers should make more efficient use of pasture than they have ever made before to help relieve the shortage of vitamin A carriers.

The vitamin D situation is satisfactory because new sources of this factor suitable for animal and poultry feeding have appeared in recent years. Fish and fish-liver oils were at one time about the only source of supply of vitamin D for poultry and livestock. Many of our common sources of vitamin D have been eliminated because of the war. A considerable amount of vitamin D from fish and fish-liver oils previously came from Japan and from Scandinavian countries. These sources are unavailable today. The Government has found it necessary to take over a number of fishing boats operating from our own coasts, and those remaining have had their fishing curtailed to some extent by the submarine menace. During the last few years the use of irradiated yeast as a source of vitamin D for four-footed animals has become common and has decreased the load on fish and fish-liver oils. The discovery of 7 dehydro-cholesterol as an effective source of vitamin D for poultry, and the manufacture of this product in this country has done much to maintain an adequate vitamin D supply. Even though the country's supply of vitamin D is ample, the farmer, during the present emergency, should not lose sight of the fact that the ultraviolet rays of the sun still are an excellent source of the antirachitic vitamin.

The use of riboflavin in feeding livestock and poultry has received much attention within recent years. Dried milk products, animal-liver meal, and alfalfa until recently were widely relied upon to supply this vitamin in livestock feeds. Much milk previously used for animal feeding is now going for human food. Liver-meal importation has practically ceased, and the alfalfa situation as explained above is acute. The riboflavin situation is, however, not too dark. Much relief is afforded at present by the use of fermentation residues from the distilling industry, which are sources of riboflavin and other members of the vitamin B complex. A word of caution should be given regarding these fermentation residues. Their vitamin potency varies widely depending upon the process of manufacture, and they can be intelligently used in a feeding program only after their vitamin content has been ascertained. Riboflavin, as well as other B complex factors, such as pantothenic acid and nicotinic acid, are available in crystalline form at prices that may make their use feasible in mixed feeds.

Protein.—As was stated earlier, the most serious shortage threatening the attainment of the production goals for meat, milk, and eggs is the matter of protein concentrates. The figures given in the following table were compiled by the Feed Industry Planning Committee and are part of a report recently made by this committee to government officials. In arriving at the figures representing the needs of the country, the committee used conservative figures in estimating the percentage of livestock and poultry that were fed on protein concentrates.

These figures for high protein concentrates alone show a shortage of 1,775,000 tons.

Why should there be a protein shortage

in this country? The largest crop of soybeans in our history was harvested in 1942. The production of livestock is up. The production of cotton is up. Let us consider some of these shortages separately. The number of animals on farms is greatly increased, but that alone does not create the increased demand, which is largely due to the fact that many farmers not previously

AMOUNTS (TONS)	MEATS AND TANKAGE	FISH MEAL	SOYBEAN OIL MEAL	COTTONSEED MEAL	LINSEED MEAL	DRIED MILK	DRIED DISTILLER'S GRAINS	BREWER'S GRAINS	GLUTEN
Needed	1,113,000	370,000	3,676,000	2,275,000	1,161,000	197,000	388,000	142,000	1,217,000
Available	850,000	100,000	3,000,000	2,200,000	892,000	85,000	388,000	177,000	1,072,000
Shortage	263,000	270,000	676,000	75,000	269,000	112,000	0	35,000*	145,000

*Estimated coverage.

following good feeding programs are now much interested in them.

What about the soybean meal situation? Did not the large 1942 crop supply us with a lot of high quality protein?

It is true that the 1942 crop of soybeans was double that of 1941. The processing capacity of the country is, however, only a little higher than it was in 1942, and, for this reason, the amount of soybean oil meal available is not proportional to the supply of beans. The unprocessed beans are not, however, good sources of protein. The amount of oil present is too great for farm livestock to use efficiently. Heat treatment, such as is given the beans in processing, is necessary to render the protein nutritionally efficient. Soybean oil meal is an excellent protein and contains a full complement of essential amino acids, but it should not be regarded as a rich vitamin source. When soybean oil meal replaces animal protein products such as meat scraps, fish meal, tankage, or milk, it is often necessary to supplement the feed with vitamins and minerals.

The meat scrap, fish meal, and tankage situation is acute to some extent because imports of these commodities have been stopped. The fish meal situation is bad not only because of the cessation of imports, but because of curtailment of fishing.

Shortages of important feeding ingredients exist. What can be done to relieve the situation? The answers are:

1. More processing capacity, particularly for soybean oil meal and dehydrated alfalfa meal, would be helpful. All are anxious that the production of war armaments not be interfered with; but the war cannot be won without food, and it is necessary to allocate materials for producing more foods.

2. Relaxing of restrictions on importation of animal protein concentrates would be helpful, particularly if transportation facilities can be found to move the material.

3. Some vegetable protein supplements should be used for feeding only after they have been properly supplemented with minerals and vitamins. In the past, much feeding has been done wherein animal protein concentrates were used excessively to supply vitamins. If vitamins are supplied independently, the protein may be reduced within certain limits without lessening their nutritional value.

4. Many animals in the past have been fed rations richer in protein than needed. Protein in feeds should temporarily be cut to the lowest levels that will produce good nutritional results.

5. Feeds may be allocated to animals or birds with high nutritional requirements at the expense of meat animals with low nutritional requirements. It may be necessary to finish meat animals on cereal grains alone, or at least without animal protein concentrates.

6. Nonproducing animals should be sold for meat.

7. The farmers should take full advantage of pasture, sunshine, and home-grown products.

8. Feed manufacturers and manufacturers of ingredients should study the nutritional value of ingredients more closely than ever before to see that these ingredients are used in such a way as to utilize their greatest nutritional value without wastage.

Veterinary practitioners will be called in on many disease cases that the farmer, because of feed shortages, may suspect as being of nutritional origin. There need be no more deficiency diseases than we have had in the past. The wise farmer will

obtain proper feeds for starting his young animals and birds and for the feeding of his breeding animals and birds. He will control the intake of protein materials to animals that are being fattened or finished. Fattening animals will grow more slowly under such a program, and the chances for the appearance of deficiency diseases are much less in the slow than in the fast growing subject. The intelligent usage of vitamin carriers in feed manufacturing and mixing will do much toward preventing the appearance of nutritional disorders.

It is believed that close coöperation between the farmers and the many agencies that serve him can do much toward attaining the 1943 production goals, even in the face of existing handicaps.

Pastures for Pigs

"Pastures are the foundation of profitable pork production. Entirely too many New York State pigs are raised in small, barren lots. The use of good pasture lowers the cost of production, makes healthier pigs, and keeps up soil fertility. An acre of good pasture, such as alfalfa, clover, or rape, properly used by pigs usually will show a greater return than it would yield if allowed to produce hay.

"An acre of good pasture furnishes enough forage for 15 to 20 full-fed pigs from weaning time or before, and until the pigs reach market weights in the fall.

"Dwarf Essex rape is an excellent annual forage crop for swine. Rape seed may be sown in the early spring at the rate of 7 to 10 pounds of seed per acre. Rape should be ready for use in about eight or more weeks after it is sown. A mixture of 6 to 8 pounds of rape seed and 1 bushel of oats per acre also provides an excellent pasture for swine."

This advice, from the New York State College of Agriculture War Emergency Bulletin No. 19, is of more importance this year than ever before. Whether it is one pig or a thousand, plans should be made now to make good pasture available this year.

Reports Now Available

The Committee on Animal Nutrition of the National Research Council is preparing a valuable series of reports dealing with present-day problems in the feeding of farm livestock. Five of these reports are now available, as listed below:

Suggestions for Meeting the War-Time Poultry Feed Situation, prepared by H. J. Almquist, R. M. Bethke and G. F. Heuser. Free.

Iodine—Its Necessity and Stabilization, prepared by W. B. Griem, E. B. Hart, J. W. Kalkus, and Howard Welch. 25 cents.

Nutrition and Reprcduction of Farm Animals, prepared by Paul H. Phillips. 25 cents.

The Flourine Problem in Livestock Feeding, prepared by H. H. Mitchell. 25 cents.

War Emergency Plans for Raising Calves and Heifers, prepared by E. S. Savage, W. E. Kraus and S. W. Mead. Free.

Orders for these reports, accompanied by remittance, should be addressed: Publication Office, National Research Council, 2101 Constitution Avenue, Washington, D. C.

For Which the Americas Say "Thank You Australia"

Under the leadline "A Message of Welcome," the *Australian Veterinary Journal* says:

The Council of the Australian Veterinary Association—the honorary secretaries of the state associations—has extended the hospitality of the professional organizations of this country to all veterinarians serving with the United States Forces in Australia.

The food inspection service of the United States Army is intrusted to the veterinary corps, and many veterinarians engaged in this work are now stationed in this country.

The opportunity for the interchange of ideas, and for discussion on matters of common interest will be eagerly sought by all veterinarians in Australia.

We extend a sincere welcome to all our colleagues from America with the knowledge that their stay in Australia will strengthen the bonds of fellowship between the veterinarians of both countries.

The veterinarians of the Americas constituting the American Veterinary Medical Association are profoundly impressed with this message of welcome to their colleagues in Australia and with all it conveys.

EDITORIAL

The Transfer of the Meat Inspection Service

On Feb. 9, 1943, Secretary of Agriculture Claude R. Wickard announced an order transferring the Meat Inspection Division from the Bureau of Animal Industry to the Livestock and Meats Branch, Food Distribution Administration. This transfer puts meat inspection into the Agency now performing the marketing and distribution functions of the Department of Agriculture and is part of the scheme evolved as a result of the President's executive order of Dec. 5, 1942, which placed upon the Secretary of Agriculture "full responsibility for and control over the nation's food program."

Under the executive order, the Department of Agriculture's administrative set-up is regrouped into three major units: the Food Production Administration, the Food Distribution Administration, and the Agricultural Research Administration. The first two are new agencies. Herbert W. Parisius, former associate director of the Office for Agricultural War Relations, was designated by Secretary Wickard as Director of Food Production but resigned five weeks later and was succeeded by M. Clifford Townsend, former AAA administrator. Roy F. Hendrickson, administrator of the Agricultural Marketing Administration, was designated Director of Food Distribution. The Agricultural Research Administration remains under the direction of Eugene C. Auchter who has held this post for some time.

In the announcement of the new administrative set-up made on December 10, 1942, Secretary Wickard also indicated the departmental agencies to be consolidated, as follows:

Into the Food Production Administration:

Agricultural Conservation and Adjustment Administration (except the Sugar Agency)

Farm Credit Administration

Farm Security Administration

That part of the Division of Farm Management and Costs of the Bureau of Agricultural Economics concerned primarily with planning of current agricultural production

That part of the Office of Agricultural War Relations concerned primarily with food production

Into the Food Distribution Administration:

Agricultural Marketing Administration

The Sugar Agency of the Agricultural Conservation and Adjustment Administration

That part of the Bureau of Animal Industry of the Agricultural Research Administration concerned primarily with regulatory activities

That part of the Office of Agricultural War Relations concerned primarily with food distribution

From the beginning, the rumored transfer of the Meat Inspection Division from the Bureau of Animal Industry, where it has served for many years as an essential cog in the machinery used to trace and help control outbreaks of infectious and contagious diseases of livestock, has caused grave concern and misgivings among cattlemen, livestock growers and loss prevention associations, sanitary officials and veterinary organizations, in fact, among all agencies which are vitally interested in the effective control of livestock plagues. The coördinated activities of the various divisions of the Bureau have been looked upon as indispensable to the all-around efficiency which that agency repeatedly has demonstrated in dealing not only with domestic disease problems but especially with foreign livestock plagues, such as foot-and-mouth disease, when introduced into this country. Such considerations are especially significant in wartime when animal disease control in foreign countries is at a low ebb and when vessels pass between our shores and foreign

ports at an accelerated rate and under wartime secrecy.

During the stress of the war emergency, the shortage of trained veterinary personnel in every activity of the Bureau of Animal Industry has become more acute. Thus, the transfer of the Meat Inspection Division with its personnel of some 900 experienced veterinarians, selected for their known efficiency in the service to be performed, removes a great reservoir of trained men from the immediate direction of the Bureau and places them where their prompt mobilization in an emergency might be delayed, and so prove disastrous. Such a contingency is a dismaying thought — especially, at a time when the livestock industry of the nation is being asked by the Department of Agriculture to vastly increase production.

It is known that many organizations directly concerned with the welfare of the livestock industry and the protection of our animal resources have watched with growing concern the change in the Bureau herein discussed. The lack of official information about the move, while it was being considered and before it was officially announced on February 9, is not easy to comprehend. So far as known, no hearings on the advisability of the transfer were ever held. Aside from the statement by the Secretary of Agriculture that "the present administrative policies of the meat inspection service will be continued without any lowering of the high standards of inspection already established," there has been no official pronouncement or assurance, to our knowledge, that the services of the Meat Inspection Division essential to and previously coördinated with other livestock disease control work of the Bureau will be available under the new set-up. In short, the rationale of the move, other than being covered by the over-all authority conferred by the executive order of December 5, has never been made clear.

Our readers will find further viewpoints expressed in Congressman Gillie's able and thoughtful speech before the House of Representatives on February 1, which is reprinted as the leading article in this issue, and in the letter of January 21 from the Board of Governors to Secretary Wickard which will be found in "The News" section.

Soldiers' Milk Supply

If we were to lose the Middlewest to the enemy, the United States would be in the same fix as Russia since the Ukraine was occupied by the Germans. Assuredly, this shall not happen, yet the losses of other nations increase the load the American farmer has to carry. Allies carrying on a shooting war in our behalf must have food as well as ordnance. The heaviest burden is falling to the dairy farmer. The number of dairy cattle, now over 25 million, must be increased, Secretary Wickard declares. Nothing is said about checking brucellosis and mastitis. On the contrary, such matters are muffed completely, even to the extent of proposing to buy up surplus cows where hired hands are scarce and scattering them to the four winds regardless of the sanitary problems involved. It might be a patriotic duty for veterinarians to step in and recommend that the cows offered for sale go straight to the butcher where they probably should have gone before the alleged milk shortage began.

What we are trying to say is that increasing the number of animals, including fowls, without planning for lowering the incidence of disease and bettering livestock health is so manifestly wrong that having to speak of it is discouraging—discouraging because the real cause of milk shortage is apt to be intensified, not removed.

That a too large percentage of food is being wiped out by diseases obviously unknown to the planners is unfortunate, but not as unfortunate as kindling the potentiality of livestock diseases by antiscientific directives. He who doesn't understand that pathology ranks pretty high as a branch of biology is playing with fire, to his sorrow—at the present time to the sorrow of a country at war. Otherwise stated, increasing the number of farm animals without a corresponding increase in vigilance against diseases is the wrong way to step up milk poundage.

The Change in Federal Meat Inspection: A Protest

INASMUCH as increasing food poundage cannot be accomplished without relative expansion of livestock sanitation, hygiene and disease control, it seems timely to recommend that less politics and more knowledge be injected into the food-production program. The stake is the nation itself, and not perhaps, as seen through the eyes of the experts who know that increasing poundage of food lies not in the breeding of more farm animals but in building up a better control of diseases which steal uncomputed millions upon millions of pounds "on the hoof." This, the planners of food-producing programs appear to ignore, for, if they are giving a thought to brucellosis, tuberculosis, foot-and-mouth disease, hog cholera, Texas fever, Johne's disease, blackleg, mastitis, swine erysipelas, helminthic parasites, scabies, infertility, to mention but a few of the food robbers, there is no evidence to that effect in either the executive or legislative branches of the government. On the contrary, the service which has made this country an important source of food supply is being wrecked in true bull-in-the-china-shop fashion without apparent knowledge of the damage done. A current example of not comprehending the operations of veterinary science in the people's behalf is disconnecting the meat-inspection service from the Bureau of Animal Industry and thus effecting a separation of its postmortem work from the service conducted by the field forces. The food-production service of the United States could not have been struck at a more vital spot, not alone by depriving the Bureau of trained personnel for emergencies which are sure to come but more particularly in disconnecting the abattoir force from that theater of operation (in the field) where battles against animal diseases are fought. Our country has been immensely enriched by the tremendous amount of postmortem work meat inspection represents. It has no equivalent in any other country nor in human medicine. Obviously, the planners are not aware that the abattoir-field relation is basic in farm-animal disease management. It is the only assembled picture of the animal-disease problem the nation has, and therefore, the sole basis for effective strategy. Had the step been taken to intentionally disrupt the war effort, a more deadly job could not have been done.

And, let's not forget to repeat that nothing under the sun will make farmers quit raising livestock and go back to the more facile business of grain farming than losses from disease. Executive supplication to produce more on patriotic grounds is no lure to the practical farmer or anyone else if the effort does not pay. It was the scientific handling of animal diseases since the turn of the century, and nothing else, that started our animal industry toward its present level. Rich soil and great acreage mean less than nothing in food production where the deadly ways of disease are not systematically and continuously circumvented. We have a large animal population because a watchful veterinary service made it profitable to raise livestock from coast to coast. Farmers and stockmen are no exception to the rule that men do not stay in business that does not pay.

War is indeed a satanic monster when it can tear asunder a service that has done as much for a country as the federal bureau of animal industry and its state connections have done for the United States. Years of careful planning, brilliant scientific researches, and faultless field work when emergencies have arisen, are expressed in a tremendous animal population and food poundage which new minds — unaware — now step in to destroy.

"Farewell Abundance, Farewell" presses itself upon the mind as a better headline for a protest against the breaking up of a service that gave so much toward the plenty the American people have enjoyed and now draw upon to save the life of their country. Not having been consulted, the veterinarian has clean hands. The makers of the change must bear the onus. It may not be light, and we shall be watching.

The veterinary profession is small, but

(Continued on next page)

New Zealand: Neighbor and Friend

The big islands lying out on the starboard, or off side, of the Australian continent previously thought of in connection with voyages of the Marco Polo-Magellan type of sea travel are now neighbors and, of course, friends. In recent years, we of the veterinary circle have heard of these islands mainly as to their lush pastures, prolific dairy herds, and useful hints from time to time on dairy-cow pathology. With the coming of World War II and lanes of rapid communication, together with consolidation of national interest, these insular lands are just across the street in the figurative sense.

Just a year ago the JOURNAL (*vide*, Feb. 1942, p. 183), more as an interesting news item than expected usefulness otherwise, published a plea for more veterinarians from the Morrinsville (New Zealand) District Veterinary Association. Demands for more dairy products and the drain of personnel to the military forces left these islands short of veterinarians.. Consequently, those available were consolidating their forces in behalf of the dairy-cattle industry. It was a case of organizing group veterinary service on a comparatively large scale. As such, the plea for personnel was regarded as a departure worth watching with considerable interest, for, like it or not, a small number of veterinarians anywhere, matched against a growing animal production, is something for the veterinary profession to watch and to study.

The main purpose of veterinary science is to serve the population, not personal profit. If war reveals this fact, it may also be cutting the pattern for a proper peacetime system. Stretching the veterinary service to every nook and every animal is the objective everywhere in the world. The penalty of not doing so is *disease, discouraged animal producers,* and *shortage of protective food* for the people. War hits the despoilers of classical veterinary service right on the chin, while the formerly thoughtless come along and beg for help. The duty of the trained veterinarian is to respond, although sulking (sit-down-strike fashion) would be more defendable than the labor union that stops making shells to get higher wages while soldiers are being shot down from lack of ammunition.

Why should New Zealand need veterinarians? The answer is that, like all of the English speaking countries, its peacetime veterinary service was not assessed at par. The same drama is being staged in Great Britain, in the United States, and in Canada. In these countries, where the total appropriations for veterinary education are pitifully deficient and the utilization of trained veterinarians in stepping up food production is not thought of by the planners, there is a clamor for food from governmental agencies which *know not how food is produced.* A letter to Executive Secretary Hardenbergh from New Zealand is illustrative. When the plea for veterinarians from North America (*loc. cit.*) was published, it caught the eye of Daniel J. Smith and his classmates about to graduate at the Ontario Veterinary College, who after rapid exchange of communications with the Morrinsville association, were on their way to New Zealand, baggage, passports, reservations and transportation all in order. Dr. Smith is a fine and proud, mental and physical specimen of North American Indian, born on a Canadian reservation, who spent twelve years of his boyhood in Chicago schools. Before departing for New Zealand, he and one of his colleagues dropped into the AVMA office to say good bye, enthusiastic over the coming adventure. In a letter received Dec. 28, 1942, dated at Le Hroka, N. Z., Dr. Smith writes:

> Have just received a letter from one of our main sources of supply and drugs are rather difficult to obtain in any quantity. As for instruments, there is a regular famine.
>
> Drs. Griesbach, Cawker and myself and two

(*Continued from preceding page*)

having age and achievement registered to its credit, its obligation to the country is to protest against any ill-conceived or shady steps involving the health of animals.

other graduates from Australia are associated with Morrinsville Veterinary Association, Morrinsville, New Zealand.

There is a level plain known as the "Waikato" quite near the Northeastern coast but separated from the sea by a range of mountains. The vegetation on this plain is amazingly profuse and cattle are grazed the year around. The "Waikato" is the most heavily populated dairy district in New Zealand, averaging one head per acre.

Each veterinarian has charge of from 12 to 14 thousand head of cattle plus a few sheep and horses.

All dairymen breed so that the calving season begins about the middle of June and early spring so that milk flow reaches its optimum during the summer months.

The diseases here are all quite common in America. We do have a tremendous number of cases of photosensitization more commonly known here as "summer eczema." During the hot days the sun's rays really seem to penetrate especially the light-skinned animals and up to the present time the condition has taken considerable toll. The losses here in the dairy industry up to the present time I would say have been exceptionally high.

Although we realize that veterinary practitioners are having a difficult time throughout the world to obtain the necessary equipment and drugs, there is a vast field of opportunity here for the veterinary profession.

s/DANIEL J. SMITH, B. V. Sc., V. D.

In this short letter one may deduce that, in preparing to prosecute a shooting war, New Zealand gave scant attention to its main industry—dairy farming. There are no adequate matériels to treat the sick cows, and losses are "exceptionally high" although the land is capable of supporting one cow to the acre on its exuberant, all-year pastures. Thus, one may truthfully declare that New Zealand, like the United States and Canada, was erroneously rated as a country with inexhaustible food resources, requiring but little, if any, protection against the stealthy ways of disease.

American animal industry began in 1493 when Columbus on his second and third voyages brought over horses, cows, and donkeys, of which the natives had none.

"J'Accuse"—Zola

Whether intended as a money-making scheme or to systematically wreck the country's war effort, pulling bricks from the foundation of scientific veterinary practice on American farms is a weird scheme of sabotage of which few of the general population can be aware.

The fifth column army operating in this country with the aid of money-filled satchels has no better alliance than the wreckers of our ancestral system of livestock sanitation. Some of the saboteurs have been executed, some are under sentence of death, some have been jailed, some are awaiting the mercy of our patient courts, some seem to be wrecking trains and burning factories as was done on a large scale in World War I, while others are probably just dupes telling the farmers to go to the drugstore instead of the doctor when animals fall sick.

The JOURNAL feels obligated to go on rebuking the divide-and-conquer strategy of Adolph Hitler whenever it pops up its sneering head; moreover the JOURNAL wants to be known as a publication that honors the commanders of the soldiers and sailors shedding their blood in sundry parts of the world, and who are bent on salvaging the liberty even of those mean (or dumb) enough to hinder the war effort by breaking down American mental and economic unity.

In an all-out-war, persons, trades and professions are expected to warn the government of dangers taught by their knowledge and experience. Half-hearted chauvinism is not sufficient. Our duty as experts on animal diseases is to warn the government that making any radical change in the operations of the veterinary service, other than building up education and research, is trekking on dangerous ground. The veterinary profession, as constituted through many decades, may be trusted to provide as good protection to the nation's food supply as was provided in building it up to the present level. Suggestions for making radical changes in the midst of a great war, not based on the coöperation within the established order, are just what all capable veterinarians will recognize—sabotage.

Horses and Mules

Steady, sensible use of horses and mules, with proper care, feed and management, increases their effectiveness so much that four horses or mules wisely handled can do the work usually done by six. The grass, hay and grain they need is available or can be raised on most farms, thus eliminating transportation problems.

Every farmer should utilize animal power as much, and motor power as little as possible. Such a course is a patriotic contribution to our war effort and will help put effective fighting tools in the hands of our armed forces, among whom may be sons of the farmers who coöperate in saving critical materials and transporation.

We are raising only about two-thirds as many horse foals, and less than one-third as many mule foals as we need for replacements to offset annual losses by death. —*Wayne Dinsmore, secretary, Horse and Mule Association.*

Nutrition

Well-fed soldiers eat products of *well-fed* animals *well-fed* on *well-fed* plants *well-fed* on *well-fed* soil. When the *"well-fed"* cycle is broken, many things with long names can happen.

The table below was omitted from the article entitled "The Relationship of Diet to the Development of Haemonchosis in Sheep" by J. H. Whitlock, H. P. Callaway and Q. E. Jeppesen, which appeared in the January, 1943 issue of the JOURNAL, pp. 34-35.

TABLE I.—Fecal Egg Counts

SHEEP NO.	EPG 8/17	EPG 8/25	EPG 8/31	EPG 9/4	EPG 9/10
1	40,600	29,000 Y	16,800	36,600 X	Dead
2	28,800	9,600 Y	000	....	200
3	21,200	8,800 Y	200	....	200
4	10,800	8,200 Y	600	....	1,200
5	11,400	1,400 Y	400	....	400
6	6,400	2,000 Y	1,000	....	600
7	3,600	600 Y	400	....	1,200
8	....	4,400 Y	6,600	2,600 X	800
9	3,600	1,000 Y	1,200	....	800
10	31,800	23,400 X	13,800	30,400 X	24,200*
11	24,400	200 X	200	....	1,200
12	18,400	200 X	200	....	200
13	12,400	1,400 X	400	....	1,400
14	11,400	5,600 X	1,400	....	600
15	5,600	2,100 X	1,000	....	200
16	7,800	12,400 X	3,600	11,000 X	5,800
17	2,800	400 X	800	....	1,400
18	....	000 X	000	....	000
19	400	000 X	200	....	....
20	31,800	14,000	Died	....	....
21	26,000	....	7,800	26,600 X	12,400
22	19,400	17,400	16,000	12,800 X	200
23	16,400	1,200	1,600	....	800
24	11,200	000	000	....	000
25	4,800	2,600	1,200	....	2,000
26	4,600	4,200	3,200	2,200 X	6,000
27	400	000	....	....	000
28	800	200	400	....	400
29	10,800	1,000	600	....	200

*Died two days later.
X = treated 10% $CuSo_4$ (12 cc.).
Y = treated 1.7% $CuSo_4$ (2 oz.).

CURRENT LITERATURE

ABSTRACTS

Bovine Brucellosis: The Immunity of "Ceased Reactors" to Reëxposure

In an observation of six years, the authors were able to confirm the belief that cows infected with a virulent strain of *Brucella abortus* usually resist reëxposure. In a group of 16 cows subjected to a second exposure, 15 produced normal calves at term and 1 aborted. Uterine exudates examined at calving time showed that all but 1 of the 15 cows were free of *Br. abortus*. As was shown by Huddleson, the percentage of ceased reactors harboring the organism was low. The active immunity, engendered by the infection, supported the conclusion that vaccination with living cultures induces a definite immunization in the treated animals, and that the immunity is of relatively long duration. [*Beach, B. A., Irwin, M. R., and Ferguson, L. C.: Response of "Ceased Reactors" in Bang's Disease to Reëxposure. Journal of Agricultural Research, 65, (Dec. 1, 1942): 523-532.*]

Nutrition the Paramount Issue

Never in all history has there been as much interest in nutrition as at the present time. [Cause: the global war. Other wars have been more or less local and the sea lanes to the sources of food were not as gravely blocked by U-boats and shortage of ships.] It was this situation that caused the President to call 900 nutrition experts to Washington a year ago to discuss the nation's needs in this respect. The conference led to the launching of the national nutrition program including educating the civilian on the eating of health-making foods for men and women in all walks of life, such as the planned ration of the soldiers.

Meat ranks first in body building. Four ounces of meat supply 24 per cent of the daily protein requirement of the average man. There are also bones, and blood, and teeth to build up. The functions of meat in this connection have long been recognized. Scientific investigations supported by the National Live Stock and Meat Board have shown that meat is a rich source of vitamin B. The discovery attracted nation-wide interest toward meat as a protective food. Never has information about food so vitally established facts about the food value of meat. [*Pollock, R. C.: Meat and Proper Nutrition. Kansas Stockman, 27, (Jan. 1943): 8-9.*]

The Hygiene of Mollusks [in North Africa*]

While everything seems to have been said about the danger presented by oysters harvested in contaminated waters, little was ever written about the other genera of shellfish (clams, mussels, slugs). One of the authors studied the rôle of oysters in an outbreak of typhoid fever (1902) and cholera (1908) in Constantinople caused by shellfish taken from the Corne d'Or and the Bosporus. Although shellfish of various genera were known to cause typhoid fever, as early as 1895 (they, too, are carriers of germs), no complete study of them was ever made.

A visit to the markets where sea foods are sold will show the prominent place mollusks other than oysters occupy in the alimentation of maritime towns. Though often cooked, many are served raw with vinegar, lemon, or other seasonings that do not destroy germs.

Although this study was made in Tangier (Morocco) the findings should apply equally well to other Mediterranean and Atlantic ports. *A priori*, the danger from these mollusks should be greater than from oysters because the latter are controlled by sanitary regulations; in thirty years of observation, no outbreaks of typhoid or paratyphoid fever were ever traced to that cause. The authors (in this report) made extensive and classical bacteriological examinations from the great stacks of shellfish which sometimes, in favorable moments, appear on the market, and they sum up their findings in saying that although the flora runs into astronomical figures, these complements are mainly harmless saprophytes incapable of causing any more trouble than mild digestive disorders. The danger is practically nil under ordinary conditions and is to be regarded as serious only in the case of cholera or water-borne epidemics. On the contrary, oyster-borne epidemics, despite regulation, have constantly increased during the past fifty years. [*Remlinger, P., and Bailly, J.: Contribution to the Study of the Hygiene of Mollusks, Other*

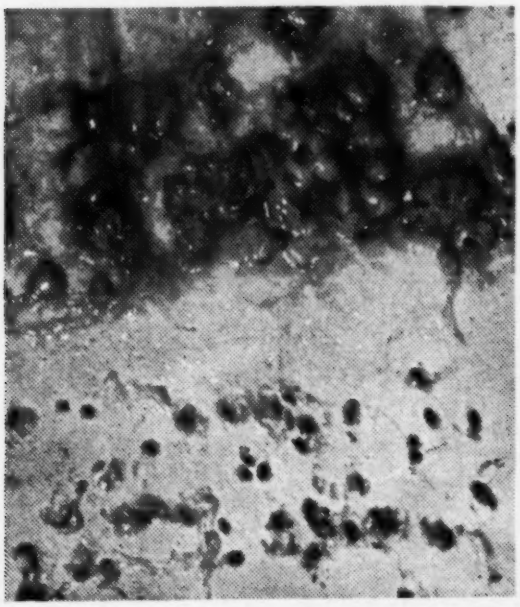
*The reason for abstracting this two-year-old article at this time is self-evident.—Ed.

than Oysters and Echinodermata. (title trans.) Revue de Mèdecine Vètèrinaire, 92, n. s. 4 (May-June, 1941): 97-112.]

Cattle Grubs (=Warbles)

Cattle grubs are the nation's enemy No. 1 in destroying meat and leather. They destroyed enough meat through federal meat inspection in one year to feed a population of 100,000—11,500,000 lb. of the choicest cuts last year, and 5,750,000 hides suffered a cut-out loss, or leather for enough shoes for 9,000,000 marching men. Eradicating grubs could have kept shoes off the rationing list.

Derris or rotenone and wettable sulfur used with a shaker can over the grub-ridden area is practical, inexpensive, and fast treatment. It is applied at 30-day intervals. The time of applying the first



Inside View of a Grub-Ridden Hide

The lower part of the picture shows the damaging holes revealed in an area where the grub cysts have been removed.

treatment in southern Texas is November; Kansas and Missouri, the middle of January; and northern Wisconsin, the middle of March, which dates correspond with the time when the grubs are turning black in getting ready to escape from the warble. Cattle should be treated thirty days before sending them to market in order that the damage inflicted to the hide may have healed. The cost per animal for two treatments is but 3½ cents. [*Ray L. Cuff, regional manager, National Live Stock Loss Prevention Board, Kansas City: Cattle Grubs are Saboteurs. The Kansas Stockman, 27, (Feb. 1943): 8.*]

Foot-and-Mouth Disease in Germany and Britain

Immune serum used on parts of the Continent confers immunity for only twelve to fourteen days and vaccines, when successful, give an immunity of but three to four months. Vaccination is also complicated by the fact that there are three types of virus between which there is no cross immunity. One type alone infected 660,000 herds of cattle in Germany in 1938 and it cost Germany $400,000,000. Denmark maintains the slaughter policy and Sweden in her own self-protection contributes to the cost thereof. Last year (1942) there were 600 to 700 outbreaks in Great Britain, many of which started among swine where it is not readily recognized by farmers. Infected swill was responsible for 18 out of 32 outbreaks studied. No outbreaks occurred where waste was passed through a concentrator plant such as are used at barracks and camps. [*The Veterinary Record, 50, (Dec. 12, 1942): 519.*]

Democracy in Agriculture

"Uniform command" is more of a battle cry than an argument, for therein lies the peril of the cure. The potentiality of uniform command in a global war is the totalitarian state. Our security rests in recognizing both the strength and weakness of democracy, in putting aside our inherent weakness of individualism and debate in order to develop the full power of our strength. But, our departure from the tenets of democracy should be temporary, otherwise the democracy we have known is gone forever. The present carnage is not a crusade for democracy unless a postwar program clearly conceives that intention. In fact, the war is not worth fighting unless we have a better world in mind. Colleges and universities should so shape the dream, and particularly so the colleges of agriculture which, through acts of Congress (1862, 1866, 1887, 1914), were given a "land-grant background" intended to establish coöperation between the federal and state governments. "Mutual coöperation" was the intention. But the trend has been altered, established policies have been disrupted, and a unified command is threatening the coöperative work. The land grants are small in comparison with the money now spent in direct help to the farmers but which should be spent through the agricultural colleges because re-

forms in farming are local affairs *per se*. For example, in 1940, the government spent $123,000,000 for agricultural personnel and allotted but $18,500,000 to the Agricultural Extension Service of the 48 states. The AAA, the FSA, and the SCS are all engaged in educational, research, and regulatory functions, often in the same county or on the same farm. This threatens to shatter agriculture's democratic base. One of the causes is the subsidies—conscience money—which the colleges receive. Another is the failure of some of the colleges to put into operation the educational program of the original (1862) relationship. This relationship should be reëstablished, but because the United States is at the crossroads of a grave crisis, unified command must be temporarily accepted. [*Hoskins, James B., president, University of Tennessee: Science, 96, (Dec. 25, 1942): 367-371.*]

Red Water, or Bacillary Hemoglobinuria

Red water occurs in certain regions of California, Oregon, Washington, Nevada, and South American countries. It is primarily a lowland disease, but is no respecter of altitude, meadow pastures, or irrigated ground that is poorly drained. It is rare on uplands and open ranges. Although it is essentially a cattle disease, sheep are occasionally affected. As it causes fairly serious losses, red water is worth preventing. Sudden outbreaks involving large numbers are rare but they do occur, particularly among susceptible cattle that have never been exposed to the infection, or where clean areas are suddenly flooded with water from dangerous ground.

The disease may be confused with anthrax by those not familiar with it. Blood-tinged urine is characteristic of both diseases and so are the high mortality (100%) and the duration which varies from a few hours to several days. The average duration is thirty-six hours.

As to symptoms, the milk flow and rumination stop suddenly, the animal stands apart from the herd and does not want to move; peculiar, sunken eyes are quite characteristic; breathing is shallow and rapid, pulse jugular fast and weak, and temperature high (106 F.), and the muzzle is hot and dry. As the course advances, bowel movements are frequent but scanty, and usually contain blood. But, the striking symptom is the coloration of the urine from which the name of the disease is derived.

Post mortem, the picture is that of hemorrhage. The splanchnic cavities contain bloody fluid; the liver is marked with a dirty, yellowish-gray area raised above the normal surface; the spleen is dark but not enlarged; the kidneys are studded with blood spots, and the urine found in the bladder is dark red.

Treatment.—An antiserum prepared at the Nevada Agricultural Experiment Station has given gratifying results: 75 per cent for all cases, early and advanced, *vis à vis* a mortality of 100 per cent for untreated cases. Pre-clinical serum treatment tends to prevent development of the infection among exposed animals. The serum is given intravenously. Medicinal treatment is of no avail. [*Records, Edward and Vawter, L. R., University of Nevada: Red Water Disease of Cattle. Texas Veterinary Bulletin, 4, (Dec. 1942):2-3.*]

Tetanus Toxoid in the United States Army

As soon as possible after entering active duty, military personnel are given 3 subcutaneous doses of tetanus toxoid. While the administration is attended with some reactions, these have not seriously interfered with the practice. There is some headache, weakness, malaise, and local soreness at the point of injection, and sometimes chills and fever. The reactions resemble those of typhoid vaccination, but are less frequent. Another type of reaction is itching and flushing of the skin, edema of the lips and eyelids, and generalized urticarial eruptions. These occur in about thirty minutes and are not common (0.05%). About 85 per cent of the reactions occur after the second or third injection, indicating that at least some of the reactors had been sensitized by the previous dose. Owing to these reactions, the use of toxoid containing Witte or Berna peptone was discontinued. Since then reactions have dropped sharply (1 to 10,000).

It is significant that no case of tetanus has been reported from battle casualties. Of 4 cases of tetanus in the Army, none had been thus immunized. [*Long, Arthur P., Major, M.C., U.S.A. Tetanus Toxoid, its Use in the United States Army. American Journal of Public Health, 33, (Jan. 1933): 53-57.*]

Lesions from Sulfaguanidine

Rats receiving sulfaguanidine develop early alterations in the arteries consisting of a thin layer of basophilic homogeneous material over the intima, short segments of elastic fibers of the media, internal elastic lamina, and other lesions. In a smaller number of blood vessels, the wall was glassy and amphophilic and less deeply stained. Necrosis of the vessel walls was noticed in a few animals. Two coronary arteries showed recent thrombi and two, incomplete obstruction of their lumens. The lesions of these arteries were more severe than those of the other organs, and there was muscle necrosis of the coagulation type. The skeletal muscles and the liver shared in the destructive process. The sequences lead to calcification of the vessels, but of different patterns. The mechanism of the action was described in previous reports. It is related to deficient vitamin B absorption in the digestive tract. The lesions are illustrated by seven photomicrographs. [*Ashburn, L. L., Daft, Floyd S., Endicott, K.*

M., and Sebrell, W. H.: Lesions of Rats Given Sulfaguanidine in Purified Diets. Public Health Reports, 57, (Dec. 11, 1942): 1883-1890.]

Snakes and Poisonous Plants in the Tropical Jungles

The prevailing idea that the jungles of the tropics are snake-infested is gross exaggeration. One will travel for days and weeks through jungle regions without ever seeing any sort of reptile. Even the snake hunters who know their snakes have plenty of trouble in finding what they are after. In twenty-two years of practical experience in Malay, Java, the Philippines, and Borneo, the author found that tropical snakes are neither common nor numerous. The ingrained fear in this connection is derived from travelers' tales which lose nothing in the telling. Such tales are a dis-service to our soldiers serving in the tropics. For deadly snakes, one comes to the United States where there are water moccasins and rattlers. In a three-months campaign in Bataan, the writer saw but four snakes, two of which were brought to him by soldiers. The same facts apply to Cuba, Panama, Honduras, Yucatan, Colombia, Venezuela, Brazil, and Ecuador.

As for the much-publicized poisonous plants, one must go to the outskirts of Boston where there is poison ivy, poison oak, or poison sumac. In the tropics, poisonous plants are rated as a minor nuisance. [*Merril, E. D.: Figments of the Imagination. Science, 97, (Jan. 8, 1943): 41-42.*]

Toxic Algae

Other than observations published in veterinary literature cited by the authors, the effect of algae on the taste, odor, and toxicity of drinking water has received but little attention. Fitch and coworker (1934) and Deem and Thorpe (1939) described fatal poisoning of ducks, turkeys, and geese, and experimental animals after drinking stagnant water scummed with the blue-green algae. They demonstrated the presence of a toxic substance in the water separated from the algae. No human outbreaks have been traced to that type of water contamination, although mention has been made of presumable algal contamination when bacterial causes could not be shown. The veterinary experiences, however, justify a study of the potential of algal pollution, slight as the risk seems to be.

The authors' investigation showed that *Microcystis aëruginosa* was somewhat toxic for mice and guinea pigs when given parenterally and but slightly toxic *per os*. It was found to be more toxic when the material is freshly gathered. The toxic substance in neutral solution withstands autoclaving and was found to be dialyzable and soluble in alcohol, and to survive the usual processes of water purification: alum coagulation, filtration, chlorination. Three other blue-green algae were found to be nontoxic for mice. [*R. E. Wheeler, surgeon; J. B. Lackey, biologist; and Stuart Schott, chemist, U.S. Public Health Service: "A Contribution on the Toxicity of Algae," Public Health Reports, lvii (Nov. 1942), pp. 1695-1701.*]

BOOK NOTICES

The Embryological Treatise of Hieronymus Fabricus of Aquapendente

A book of nearly 900 pages embalmed in the Latin language for 341 years and never before translated into a modern tongue, on a subject as recondite as embryology was in the sixteenth century, is truly a priceless possession, not so much as the copy of a rare scientific book but more particularly as proof that the early anatomists of Padua (Benedictus, Vesalius, Realdus, Columbus) were scientists of the upper cadre and well versed on this difficult subject.

De formatione Ovi et Oulli (= The formation of the egg and of the chick) and *De Formato Foetu* (= The formed fetus) show clearly that scientific knowledge of embryology is not so new. The text and the fine illustrations of this rare volume attest in no uncertain manner to the part it must have played in the advancement of medicine.

The embryology of Hippocrates, Aristotle, Galen, and their medieval successors was collected by Fabricus at the turn of the century (16th). But, he published this book only to have it lie buried in a dead language until 1942. It was but last year that Howard B. Adelmann, of Cornell University, undertook the task of translating it and of writing the gripping commentaries the translation contains. These are 70 pages which shed a great deal of light on ancient and medieval medical history. The pre- and post-Christian conceptions of embryology which are so well told could hardly be improved upon as basic historical material. One sees the part played by the Arabs after the Christians had annihilated the scientific literature handed down by the "B.C. doctors." It was Hieronymus Fabricus who first pointed out the errors of the ancients (*vide, Multa illos fugisse, multa fefellisse*), that is, of Hippocrates of Cos, of the immortal Homer, of Aristotle, and of the post-Christian Galen whose erroneous doctrines survived too long because medicine, like other sciences, had died by human hands.

[Harvey was yet to write his thesis on the circulation of the blood (1628) when this book was written by a professor of Padua in 1602.—ED.]

There are numerous woodcuts of the old

printers, of fetuses of woman, ewe, cow, sow, bitch, mouse, proving the use made of comparative anatomy in the advancement of medical science. The cuts of the normal position of the fetus and the drawings of the vascularity of the fetal membranes would answer their purpose today.

What stirs the admiration is that all this happened before there was any agreement on the circulation of the blood. The interpretations of the functions of the chorion, each of the two layers of the allantoid and of the amnion are simply arresting under the circumstances—certainly, a compliment to the old masters who were paving the way for the march of medicine.

Biologists, students of medical history and of embryology, and teachers of veterinary students will appreciate this wonderful book, immensely. While, perhaps, apart from the mill run of books read by the average veterinarian, it has many hours of pleasure for any reader who has a flair for the curious. [*The Embryological Treatise of Hieronymus Fabricus of Aquapendente, translated with a commentary by Howard B. Adelmann, Professor of Histology and Embryology, Cornell University. Illustrated. Cloth. 882 pages. Cornell University Press, Ithaca, N. Y. Price $12.00.*]

Infectious Diseases of Domestic Animals

Dean Hagan, New York State Veterinary College, Cornell University, catapults a brand new idea into the literary caldron in the form of a masterpiece of 665 properly illustrated pages gracefully covering the subject without deserting his first "big moment"—bacteriology. The microbic causes "make" the headlines, and disease, the text material. Witness, the two pages on *Brucella abortus* and the 20 pages on how to manage this microbe in the practice of veterinary medicine.

It is apparent that in abridging *what microbes are* and expanding *what microbes do*, Hagan was able to give the veterinary profession a precious book without sinning against his lifelong specialty. Yet, nowhere in the volume are any of the salient (utilitarian) points of microbiology discarded, notwithstanding that the theme is pathology—immunology, diagnosis, therapeutics, sanitary science and its practical application. In skipping over nonessential minutiae and retaining what everyone wants to know about the specific agent concerned in the study of a disease, the author has done an excellent job for the practitioner of veterinary medicine.

While those infections of particular interest to the North American predominate, the exotic diseases of our ever-narrowing world are not overlooked. There is no telling how many American veterinarians, at this moment, are in contact with animal diseases they know but vaguely by name, nor how soon other foreign infections will visit home territory.

Appropriately, the frontispiece is a picture of Cooper Curtice looking askance at ticks fixed to the neck of a cow dead of Texas fever. The book has 6 parts, divided respectively into 44 chapters. Part I (71 pages), the academic approach to the study of infection, covers that vast field in straight-cut fashion without redundance. Causes, protection, toxins and antitoxins, lysis, agglutinins and precipitins, the phagocytes, anaphylaxis and allergy, blood groups, *et al.*, are boiled down to common denominators without trifling with space-consuming doctrines useful only in their proper place.

Beyond (Parts II to VI), is a treatment of the more common infectious diseases introducing the causative agents (bacteria, Protozoa, fungi, viruses). These diseases are dealt with in detail, representing twenty years of study, research, and teaching which, heretofore, the author has disclosed only in scattered periodical literature. In combing the material, one is impressed with the absence of careless remarks, immature theory, archaic notions, and technical errors. Pictures are used where needed; typography and topography are excellent; didactics, paper, binding, and type facings leave little to criticize. Lack of "up-to-dateness" is nowhere detectable, as will be observed in such maladies as hog-cholera, canine and fox distempter, rabies, and equine encephalitis, which are gazetted in the part devoted to viruses.

But, along with the well-deserved and sincerely meant panegyrics, let's punch a hole. The author can "take it." By what token has a scientist the right to fabricate common nouns and plurals out of generic names, granted the convenience of doing so in medical writing? If, for example, "coccidia" is a fine-looking plural for "Coccidium," just why isn't it entitled to a great big *C* at the sinister end? Do we have to get used to such words to avoid debates? What to do? What to do?

Chef d'ouvre defines our rating of this book, were the achievements of the author not a sufficient guarantee. Except in scattered articles, always hard to locate when wanted, this book has no substitute in our collection. To keep abreast with the times, to practice scientific veterinary medicine, and to have a precious reference at hand, the student, the teacher, the practitioner will need this fund of veterinary knowledge. It deserves and no doubt will have universal popularity. To the chain of Cornell books which have enriched veterinary literature since Law, Hagan's addition is a strong link. [*The Infectious Diseases of Domestic Animals with Special Reference to Etiology, Diagnosis, and Biological Therapy, by William Arthur Hagan, D.V.M., D.Sc., Professor of Bacteriology and Dean of the Faculty, New York State Veterinary College, Cornell University. Comstock Publishing Company, Inc., Ithaca, N.Y. Cloth. Illustrated. 665 pages. Price $6.00.*]

THE NEWS

Letter to Secretary of Agriculture Wickard from the Board of Governors

American Veterinary Medical Association
Chicago, Ill., January 21, 1943.

Hon. Claude R. Wickard,
Secretary of Agriculture,
Department of Agriculture,
Washington, D. C.

DEAR MR. SECRETARY: The board of governors of the American Veterinary Medical Association are much concerned about the future of the Federal Meat Inspection Service and the disease control and prevention agencies which have been directed so long and so efficiently by a veterinarian as chief of the Bureau of Animal Industry.

The fact that the United States is today the safest place in the world in which to grow livestock is not the result of mere accident but of planned and practical methods, based on scientific knowledge such as:

1. The control of infectious diseases within the country itself.

2. The development and enforcement of regulations which have served, with rare exceptions, as effective barriers against the introduction of livestock disease plagues prevalent in other countries.

For over 50 years the Federal Bureau of Animal Industry has had the benefit of competent veterinary direction and has functioned faithfully and efficiently in protecting our livestock industry.

In coöperation with the entire veterinary profession, it has completely rooted out or brought under control several devastating livestock diseases and has eradicated foreign plagues on the few occasions that they have been introduced into this country.

The system of animal disease control developed in the United States has been the marvel of its kind and the envy of other countries.

It spells the difference between a prosperous agricultural nation and one burdened by enormous losses.

Moreover, the effective control of infectious and contagious diseases of animals under competent veterinary direction has been an important public-health factor through the suppression of those animal diseases which are transmissible to man.

On the basis of the record, there would seem to be no justification for a change in the administration or the make-up of the Federal Bureau of Animal Industry, both of which have enabled it to function as a well-rounded unit to meet all requirements and emergencies. Of all times in the Nation's history, it would seem particularly ill-advised now to make changes which might create confusion and impair the proven efficiency of an organization when it is most essential to the successful prosecution of the war program.

It is therefore our firm conviction that, for the best interests of the entire country, the Federal Bureau of Animal Industry should remain as an intact working organization and with all its forces under the unified direction of a veterinarian as chief.

Sincerely yours,

O. V. BRUMLEY,
Dean, School of Veterinary Medicine, Ohio State University, and Chairman, Board of Governors, American Veterinary Medical Association.

W. W. DIMOCK,
Head, Department of Animal Pathology, University of Kentucky, and President, American Veterinary Medical Association.

C. W. BOWER,
Practitioner, Topeka, Kans., and President-elect, American Veterinary Medical Association.

J. G. HARDENBERGH,
Executive Secretary, American Veterinary Medical Association, Chicago, Ill.

Can You Help Locate These Lost Members?

The aid of JOURNAL readers is solicited in locating the following members, mail to whom has been returned to the Association's central office. The last known address of each is given. Should you be able to provide information as to present residence, your advice *via* postcard or letter will be greatly appreciated.

Blostein, Morris E., 819 S. Main St., Horseheads, N. Y.

Blumenthal, Jacob C., Brainerd, Minn.

Bruce, Ralph A., Prescott, Kansas.

Castro, Fred, General Delivery, Omaha, Neb.

Cohen, George, Pine Camp, N. Y.
Cox, Wm. L., Box 2074, Raleigh, N. Car.
Dalziel, G. Teddy, 104-4th Ave., San Mateo, Calif.
Derrick, Geo. W., Elbridge, N. Y.
Field, Dale W., 17th at Ingersoll, Des Moines, Iowa.
Franklin, Ted E., 3121 Ave. G., Fort Worth, Texas.
Gould, Kenneth Max, Elkhorn, Neb.
Hander, Raymond T., Box 865, Childress, Texas.
Hanna, Charles G., Scranton, Iowa.
Heisel, Allen M., Cascade, Colo.
Henkel, Ernest L., 907 Myrtine St., Enumolaw, Wash.
Holtzman, Jacob, Station Hosp., Army Air Base, Fort Douglas, Utah.
Hupp, Lynn D., 1339 E. Armour, Kansas City, Mo.
Krenek, Emil, Rt. 2—Box 55, Deming, N. Mex.
Lohmeyer, Carl, Co. B—26th M.T.B., Camp Grant, Ill.
Loiler, M. E., Farragut, Iowa.
McFarlane, J. F., Main St., Payette, Idaho.
McGill, Dana T., Mt. Sterling, Ill.
MacEachern, Gordon, A.A.B., Jacksonville, Fla.
Marks, Bernard, Vet. Hosp., Fort Benning, Ga.
Mathis, Rudy C., State Veterinarian, Atlanta, Ga.
Moffat, Geo. Colvin, 5732 W. Cermak Rd., Cicero, Ill.
Nevin, Stanley M., Fort Jackson, S. Car.
Niffenegger, D. L., Camp Gordon, Ga.
Reed, Myron D., New York State Veterinary College, Cornell University, Ithaca, N. Y.
Schmille, H. F., Westboro, Mo.
Spears, C. J., Dublin, Ga.
Snodderly, W. J., 303 Live Stock Exchange Blvd., Denver, Colo.
Snodgrass, W. B., Ford Ord, Calif.
Thayer, Leslie F., Box 253, Lewisburg, W. Va.
Thompson, L. G., Swainsboro, Ga.
Vance, Arthur, Vernal, Utah.
Wingerter, A. R., R. R. No. 1, Big Rapids, Mich.

A. E. Cameron and W. A. Hagan Elected to Executive Board

A. E. Cameron, Veterinary Director General, Health of Animals Branch, Dominion Department of Agriculture, Ottawa, Canada, and W. A. Hagan, Dean, New York State Veterinary College, Ithaca, New York, have been reëlected as members of the Executive Board for terms ending in 1947. Dr. Cameron will represent District I (Dominion of Canada) and Dean Hagan will represent District IX (New York State and the New England states).

The polls for these elections closed on January 21 and a large percentage of members in both districts cast their ballots. The Board of Governors (Drs. O. V. Brumley, W. W. Dimock, C. W. Bower) served as tellers while in Chicago recently and certified the results as given above.

What the Newspapers Say

(Excerpts from Educational Publicity Material issued by the AVMA Public Relations Department.)

Chicago Drovers Journal
(Nov. 17, 1942)

There is no need to get excited about it or overdo it, but hogs are such good property today that unnecessary losses hurt. Thus we mention two hog disease warnings that appear in the mail. One is from a committee of the American Veterinary Medical Association. It is devoted to influenza, that could "deal a hard blow to next spring's pig crop."

"The threat to brood sows and to the new pig crop is especially serious because, while hogs may seem to recover, influenza frequently causes brood sows to lose their pigs or to fail to produce vigorous litters. The disease is baffling to many farmers because it manifests symptoms which are similar to several other serious swine diseases. Unless prompt veterinary diagnosis is obtained, the owner may lose many valuable hogs through failure to have them treated for the proper malady. . ."

Fallon (Nev.) Eagle
(Dec. 28, 1942)

Nevada hog raisers were warned this week by Dr. Edward Records, of the department of veterinary science of the University of Nevada, to be on the alert for swine erysipelas in their herds. . .

A report on the disease recently released by the American Veterinary Medical Association, Records said, outlined the symptoms of the disease and how it spreads.

"The soil of many swine-raising areas is now impregnated with the erysipelas organism, adding greatly to the normal hazards of hog production," the report declared.

"The disease shows certain features resembling hog cholera and swine influenza, which makes diagnosis more difficult, even for the skilled veterinarian. In fact, veterinarians often find that they have to resort to laboratory examination to be positive as to the exact disease. . ."

Litchfield (Ky.) News
(Nov. 20, 1942)

One of the world's most ancient swine diseases, erysipelas, is spreading so rapidly that it may soon outrank cholera as a killer of hogs, according to the American Veterinary Medical Association. Dr. W. W. Dimock, of the Kentucky Agricultural Experiment Station, is president of the association.

This disease strikes with deadly swiftness

when the hog population of the United States is the largest in history, and when a further increase of 10 per cent in production is needed to help further the war effort. . .

Moline (Kans.) Advance
(Dec. 24, 1942)

Swine erysipelas is now spreading so extensively in American farming areas that it may soon outrank hog cholera as a killer of farm animals, according to information published in the official journal of the American Veterinary Medical Association.

This fall's increased hog production broadens the threat of erysipelas and the danger of complications with other diseases. . .

Topeka (Kans.) State Journal
(Jan. 3, 1943)

Elaborate steps now taken to guard America's food for the fighting men, from the farm to the battle fronts, were told by Dr. Charles W. Bower, of Topeka, president-elect of the American Veterinary Medical Association, in an address at Oakland, Calif., Tuesday, before the annual California veterinary medical convention.

"Animal disease could easily become one of the most devastating forms of wartime sabotage, were it not for the fine system of coördinated veterinary service which has been built up in America during the past century," he said. . .

Lennox (S. D.) Independent
(Dec. 17, 1942)

One of the world's most ancient swine diseases, erysipelas, is now spreading so extensively that it may soon outrank hog cholera as a killer of farm animals, veterinary authorities report in the official Journal of the American Veterinary Medical Association.

"The disease never before has struck so fruitful a medium for spreading as the congested swine population of the American Corn Belt, with the prospect that it can root itself widely and permanently into American soil," the report states.

Sacramento (Cal.) Union
(Dec. 27, 1942)

Dr. B. B. White of Sacramento is one of a score of the nation's outstanding veterinarians who will speak during the three-day wartime California veterinary conference in California Polytechnic College, San Luis Obispo, January 4 to 6, officials announced yesterday.

Dr. G. W. Closson, San Gabriel, president of the state association, will reply to opening remarks and welcome to be made by Julian A. McPhee, California Polytechnic president. . .

Alexandria (La.) Town Talk
(Dec. 15, 1942)

The United States has been flying veterinarians and scientific equipment to England to help check disease among Britain's beef and dairy cattle, and thus increase food supplies, it was reported today.

Dr. John R. Mohler, chief of the U. S. Bureau of Animal Industry, said in the Journal of the American Veterinary Medical Association that veterinarians already have set up in England a complete system duplicating the effective methods used in America for control of Bang's disease, also called infectious abortion.

"It is likely that use of the special strain of vaccine sent from this country will help to increase the wartime beef and milk output of the British herds," he said.

Dr. C. L. Mingle of the Bureau's animal disease station at Beltsville, Md., took over the first vaccine culture—a strain which had taken years of veterinary research to develop. . .

Beaver City (Utah) Press
(Dec. 4, 1942)

Farmers in Utah should be on the alert against erysipelas, one of the world's most ancient swine diseases, which is spreading extensively throughout the nation's agricultural areas, cautions David E. Madsen, animal pathologist of the Utah State Agricultural College Experiment Station.

"While the disease is not yet widespread in Utah, it is becoming more common," Mr. Madsen points out. "It has also caused some loss in sheep and turkeys in this area," he adds.

Veterinary authorities of the American Veterinary Medical Association warn that this fall's increased hog population broadens the threat of erysipelas, and the danger of complication with other diseases. . .

Indianapolis Star
(Jan. 3, 1943)

National leaders in the profession will discuss scientific subjects before the Indiana Veterinary Medical Association's 59th annual convention January 12-14 in Hotel Severin. Dr. C. C. Donelson of Indianapolis is program chairman.

Heading the list of speakers is Dr. W. W. Dimock of the University of Kentucky, president of the American Veterinary Medical Association. Others include Dr. W. R. Krill of the Ohio State University department of veterinary medicine; Dr. E. S. Weisner, professor of poultry pathology of Michigan State College at Lansing; Dr. C. C. Hastings of Williamsville, Ill.; Dr. A. H. Schmidt of Triumph, Mich.; Dr. C. R. Donham and Dr. L. P. Doyle of Purdue University. . .

San Antonio (Tex.) Standard Times
(Dec. 29, 1942)

Swine erysipelas is not widespread at present in Texas, says E. M. Regenbrecht of the A. and M. College Extension Service, commenting upon a warning from the American Veteri-

nary Medical Association that the disease was spreading in American farming areas.

The warning, issued by Dr. J. G. Hardenbergh, executive secretary of the association, cautioned that the disease "may soon outrank hog cholera as a killer of farm animals."

Manhattan (Kans.) Chronicle
(Jan. 5, 1943)

Plans for the thirty-ninth annual meeting of the Kansas Veterinary Medical Association which will bring together more than 200 veterinarians from all parts of Kansas for a two-day session in Manhattan, January 11 and 12, were announced today by Dr. Harry F. Dotson, president of the association.

Several representatives of the United States Army Veterinary Corps, the American Veterinary Medical Association, and the United States Bureau of Animal Industry are expected to attend the meeting which will be on the Kansas State College campus.

NEWSPAPER HEADLINES

Veterinarians Preventing Sabotage of Food.—*Topeka (Kans.) Daily Capital.*

Guard Swine from Erysipelas.—*Sulphur Springs (Tex.) Echo.*

AVMA Officers Include Twelve K-State Graduates.—*Manhattan (Kans.) Collegiate.*

Ancient Hog Disease Spreads over Nation.—*Litchfield (Ky.) News.*

Erysipelas Seen as Danger for Hogs.—*Longview (Tex.) Journal.*

Veterinarians Play Big Part in Producing Food Stuffs.—*Lawrence (Kans.) World.*

Three Groups (merchants, bankers, veterinarians) Aid Hog Increase Drive.—*Sidney (Neb.) Telegram*, Dec. 10, 1942.

Student of Veterinary Medicine Enlists in Army Reserve Corps.—*Birmingham (Ala.) News*, Dec. 20, 1942.

Meat Inspection Features Meeting of Veterinarians.—*Cedar Rapids (Ia.) Gazette*, Dec. 8, 1942.

Fly Veterinarians to England.—*Chicago Herald-American*, Dec. 15, 1942.

Officers of the United States Live Sanitary Association for 1943

W. H. Hendricks, *president*, Salt Lake City, Utah.

J. M. Sutton, *first vice-president*, Sylvester, Ga.

R. A. Hendershott, *second vice-president*, Trenton, N. J.

Wm. Moore, *third vice-president*, Raleigh, N. C.

Mark Welsh, *secretary-treasurer*, College Park, Md.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws — Article X, Section 2.

First Listing

ARENAS, ENRIQUE J.
Nataniel 814, Santiago, Chile.
M.V., Universidad de Chile, 1941.
Vouchers: J. San Miguel and A. Baglina.

BITTENCOURT, OITY GUIMARAES
Escola Superior de Veterinaria, Caixa Postal 567, Belo Horizonte—Est. de Mintas—Brazil.
D.V.M., Escola Sup. de Agricultura e Veterinaria Vicosa—Est. Minas, 1937.
Vouchers: J. G. Hardenbergh and A. V. Machado.

BRINEY, E. B.
Bennington, Kansas.
D.V.M., Kansas City Veterinary College, 1918.
Vouchers: Chas. W. Bower and T. P. Crispell.

DIETRICH, L. E.
P. O. Box 1116, 408 Harding, Wichita, Kansas.
D.V.M., Kansas City Veterinary College, 1917.
Vouchers: J. A. Bogue and Chas. W. Bower.

FRETZ, H. L.
Atwood, Kansas.
D.V.M., Kansas City Veterinary College, 1906.
Vouchers: E. J. Frick and Wm. L. Sippel.

GOUGE, R. E.
711 W. Main St., Sedalia, Mo.
D.V.M., Kansas State College, 1936.
Vouchers: H. W. Young and F. H. Suits.

GRADESS, MORTON
York Rd. and Washington Lane, Jenkintown, Pa.
V.M.D., University of Pennsylvania, 1936.
Vouchers: A. Bachrach and A. J. Rosenberg.

HAINES, CHAS. E.
P. O. Box 345, Winfield, Kansas.
D.V.M., Kansas City Veterinary College, 1915.
Vouchers: F. B. Croll and Ashe Lockhart.

HARRISON, D. G.
Box 46, Ringoes, N. J.
V.M.D., University of Pennsylvania, 1932.
Vouchers: W. B. Maxson and W. F. Harrison.

JACKSON, CHAS. W.
116 E. Madison St., Iola, Kansas.
D.V.M., St. Joseph Veterinary College, 1921.
Vouchers: M. F. Wallace and Ashe Lockhart.

JOHNSON, E. C.
Mankato, Kansas.
D.V.S., Kansas City Veterinary College, 1907.
Vouchers: E. J. Frick and Wm. L. Sippel.

JONES, LEON V.
22041 Beech St., Dearborn, Mich.
D.V.M., Michigan State College, 1940.
Vouchers: C. E. Turnbull and F. D. Egan.

KENZY, SAM GEORGE
1500 N. 5th St., Temple, Texas.
D.V.M., Iowa State College, 1942.
Vouchers: G. H. Conner and I. A. Merchant.

KER, WILLIAM O.
Station Hosp., Camp Tyson, Tenn.
V.M.D., University of Pennsylvania, 1942.
Vouchers: S. F. Scheidy and J. D. Beck.

KERNS, ROBERT L.
1940 N. Prospect Ave., Milwaukee, Wis.
D.V.M., Colorado State College, 1942.
Vouchers: J. G. Hardenbergh and A. W. Lange.

MCCANNON, WILLIS B.
Med. Dept., Army Air Base, Lake Charles, La.
D.V.M., Iowa State College, 1938.
Vouchers: C. H. Horcher and R. M. Parker.

MCVAIGH, FRANK
Kincaid, Kansas.
D.V.S., Western Veterinary College, 1901.
Vouchers: M. F. Wallace and Ashe Lockhart.

MACNAMEE, J. K.
Dept. of Pathology, Alabama Polytechnic Institute, Auburn, Ala.
D.V.M., Alabama Polytechnic Institute, 1936.
Vouchers: W. E. Cotton and F. P. Woolf.

MEINERSHAGEN, B. H.
109 E. 18th St., Higginsville, Mo.
D.V.M., Kansas City Veterinary College, 1908.
Vouchers: Ashe Lockhart and G. L. Dunlap.

MITCHELL, CHAS. J.
167 Brant Ave., Brantford, Ont., Can.
B.V.Sc., Ontario Veterinary College, 1942.
Vouchers: C. D. McGilvray and L. Stevenson.

PADFIELD, EDWIN THOMAS
5530 Vineland Ave., North Hollywood, Calif.
B.V.Sc., Ontario Veterinary College, 1938.
Vouchers: R. W. Case and G. L. Dayman.

RATTRAY, J. E.
10750-101 St., Edmonton, Alberta, Can.
B.V.Sc., Ontario Veterinary College, 1938.
Vouchers: P. R. Talbot and T. L. Jones.

SHANNON, J. VERNON
Hq. 103d Infantry Division, Camp Claiborne, La.
D.V.M., Kansas City Veterinary College, 1916.
Vouchers: D. E. Evans and E. F. Ebert.

SPENCER, W. H.
310 East Park, Yates Center, Kansas.
D.V.M., Kansas City Veterinary College, 1911.
Vouchers: G. A. Rathman and E. J. Frick.

STEELE, E. H.
Neodesha, Kansas, R. F. D. No. 1.
D.V.M., Kansas City Veterinary College, 1915.
Vouchers: M. F. Wallace and Ashe Lockhart.

TIERKEL, ERNEST S.
328 W. 89th St., New York, N. Y.
V.M.D., University of Pennsylvania, 1942.
Vouchers: J. D. Beck and E. J. Van Tilborg.

WARD, VICTOR
P. O. Box 38, Atascadero, Calif.
D.V.M., San Francisco Veterinary College, 1912.
Vouchers: J. L. Tyler and A. M. McCapes.

WILLIAMS, C. V.
Marshall County, Frankfort, Kansas.
D.V.S., Kansas City Veterinary College, 1909.
Vouchers: M. F. Wallace and Ashe Lockhart.

Second Listing

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Crutchfield, Wm. O., 101 Williamson Rd., Roanoke, Va.
Davis, R. R., 1218 Roosevelt, San Antonio, Texas.
Foote, Lon E., 2716 Bosque Blvd., Waco Texas.
Hardy, D. B., Liberal, Kansas.
House, Donald Dean, A.A.F.B.A.S., Bainbridge, Ga.
McLaughlin, A. R., 219 W. 74th St. Terrace, Kansas City, Mo.
McLean, Harvey Ross, 1368 Main St., E., Hamilton, Ont., Can.
Serrot, M. D., Medicine Lodge, Kansas.
Snyder, Raymond C., Walnut St. & Copley Rd., Upper Darby, Pa.
Staggs, Geo. W., Rt. No. 2—Box 3, Tacoma, Wash.
Stincer, M., Correa No. 16, Havana, Cuba.
Tierkel, Ernest, S., 328 W. 89th St., New York, N. Y.
Thomas, George O., Jr., Assistant Port Vet., New Orleans Port of Embarkation, New Orleans, La.
Trowbridge, J. W., Malden, Mo.
Ward, H. C., 508 Market St., Fulton, Mo.
Wilkinson, J. A., 1817 Western Ave., Fort Worth, Texas.

1943 Graduate Applicants

First Listing

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Colorado State College

ADAMI, ROBERT W., D.V.M.
1202 Fifth St., San Fernando, Calif.
Vouchers: K. W. Smith and I. E. Newsom.

AUSHERMAN, ROBERT J., D.V.M.
Miami, N. Mex.
Vouchers: J. Farquharson and K. W. Smith.

BEGGS, W. E., D.V.M.
204 East Oak, Lamar, Colo.
Vouchers: J. Farquharson and K. W. Smith.

BOUTON, G. N., D.V.M.
9357 E. Colfax Ave., Aurora, Colo.
Vouchers: K. W. Smith and M. J. Jarvis.

COOPER, EMANUEL S., D.V.M.
1547½ Wooster St., Los Angeles, Calif.
Vouchers: J. Farquharson and K. W. Smith.

COSTA, ANTHONY J., D.V.M.
Rt. No. 1, Trinidad, Colo.
Vouchers: J. Farquharson and K. W. Smith.

EPLING, GLENWOOD P., D.V.M.
308 Pitkin St., Fort Collins, Colo.
Vouchers: K. W. Smith and V. D. Stauffer.

FOSTER, WILLIAM M., D.V.M.
Rt. No. 2, Box 673, Modesto, Calif.
Vouchers: I. E. Newsom and K. W. Smith.

GILLISPIE, J. MARVIN, JR., D.V.M.
1433 W. Mountain Ave., Fort Collins, Colo.
Vouchers: J. Farquharson and M. K. Jarvis.

HENRY, JERROLD N., D.V.M.
698 Arbor Dr., San Leandro, Calif.
Vouchers: J. Farquharson and K. W. Smith.

HITTLE, HAROLD E., D.V.M.
Box No. 3, Hartman, Colo.
Vouchers: K. W. Smith and J. Farquharson.

KIEFER, URAL K., D.V.M.
415 W. Myrtle St., Fort Collins, Colo.
Vouchers: K. W. Smith and J. Farquharson.

LANGRIDGE, JOHN RUSSELL, D.V.M.
3791 S. Cherokee, Englewood, Colo.
Vouchers: K. W. Smith and J. Farquharson.

LANPHEAR, PAUL R., D.V.M.
1221 Remington St., Fort Collins, Colo.
Vouchers: J. Farquharson and R. F. Bourne.

McELYEA, ULYSSES, D.V.M.
Las Cruces, N. Mex.
Vouchers: R. F. Bourne and J. Farquharson.

MARCUS, MELVIN JACOB, D.V.M.
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Vouchers: J. Farquharson and K. W. Smith.

NICHOLES, MAX M., D.V.M.
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Vouchers: K. W. Smith and M. K. Jarvis.

RAMSAY, LAWRENCE G., D.V.M.
217 E. Buffalo, Rawlins, Wyo.
Vouchers: K. W. Smith and M. K. Jarvis.

RICHARDS, ROBERT BOOTH, D.V.M.
1302 S. Downing St., Denver, Colo.
Vouchers: J. Farquharson and K. W. Smith.

RIGGS, CHARLES W., D.V.M.
1123 W. Russell Pl., San Antonio, Texas.
Vouchers: J. Farquharson and K. W. Smith.

VON TOUR, ELISHA, D.V.M.
Colonial Apts. No. 8, Sterling, Colo.
Vouchers: J. Farquharson and K. W. Smith.

WATSON, GEORGE R., D.V.M.
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Vouchers: J. Farquharson and K. W. Smith.

WEBB, JACK HOWARD, D.V.M.
321 W. 13th St., Loveland, Colo.
Vouchers: J. Farquharson and K. W. Smith.

WESTFALL, RALPH DAVID, D.V.M.
R.F.D., Colusa, Calif.
Vouchers: J. Farquharson and K. W. Smith.

ZONTINE, WILLIAM J., D.V.M.
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Cornell University*

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ARNABOLDI, ALLAN C., D.V.M.
N. Country Rd., Mt. Sinai, L. I., N. Y.
Vouchers: H. C. Stephenson and H. J. Milks.

BECKER, MILFORD E., D.V.M.
R. F. D. No. 2, Altamont, N. Y.
Vouchers: H. L. Gilman and W. S. Stone

BRUNGOT, NORMAN S., D.V.M.
Milan Rd., Berlin, N. H.
Vouchers: H. J. Milks and H. C. Stephenson.

BURGHARDT, HARRY F., D.V.M.
244-15 54th Ave., Douglaston, L. I., N. Y.
Vouchers: H. C. Stephenson and A. G. Danks.

CLEVELAND, HOWARD J., D.V.M.
50 Jefferson St., Cattaragus, N. Y.
Vouchers: W. J. Gibbons and H. C. Stephenson.

CONKLIN, ERWIN A., D.V.M.
Richville, N. Y.
Vouchers: J. N. Frost and H. C. Stephenson.

DILLMANN, EUGENE, D.V.M.
838 Bellmore Ave., Bellmore, L. I., N. Y.
Vouchers: H. J. Milks and A. G. Danks.

FISHER, BERNARD, D.V.M.
201 Williams St., Ithaca, N. Y.
Vouchers: H. C. Stephenson and A. G. Danks.

GILBERT, EDWIN O., D.V.M.
169 Gregory Ave., West Orange, N. J.
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GUMAER, KENNETH I., D.V.M.
32 Woodland Ave., Poughkeepsie, N. Y.
Vouchers: H. C. Stephenson and A. G. Danks.

HALPIN, GEORGE D., D.V.M.
Jamesville, N. Y.
Vouchers: A. G. Danks and H. C. Stephenson.

HANER, JR., FRANK H., D.V.M.
Greene County, Hensonville, N. Y.
Vouchers: H. L. Gilman and H. J. Milks.

HOKANSON, JOHN F., D.V.M.
Lake St., Pleasantville, N. Y.
Vouchers: H. J. Milks and H. C. Stephenson.

HOPPER, H. DEAN, D.V.M.
128 S. Maple Ave., Ridgewood, N. J.
Vouchers: H. C. Stephenson and A. G. Danks.

HUCKLE, JOHN J., D.V.M.
3 Garden Ave., Ithaca, N. Y.
Vouchers: J. N. Frost and M. G. Fincher.

JENKINS, DUBOIS L., D.V.M.
New Paltz, N. Y.
Vouchers: H. J. Milks and H. C. Stephenson.

KIESEL, GEORGE K., D.V.M.
18 Highland Terrace, Manhasset, L. I., N. Y.
Vouchers: A. G. Danks and P. Olafson.

KOTCHEK, LEO, D.V.M.
2912 Brighton 7 St., Brooklyn, N. Y.
Vouchers: C. E. Hayden and H. J. Milks.

LANFAIR, CLYDE E., D.V.M.
Warrensburg, N. Y.
Vouchers: H. H. Dukes and A. G. Danks.

LARSON, LEONARD J., D.V.M.
61 W. Sunrise Hwy., Merrick, N. Y.
Vouchers: J. N. Frost and H. C. Stephenson.

LEWIS, NORMAN FRANCIS, D.V.M.
34-31 Linden St., Flushing, L. I., N. Y.
Vouchers: H. C. Stephenson and H. J. Milks.

LINDSEY, LIONEL W., D.V.M.
Lake Road, Seneca Falls, N. Y.
Vouchers: C. E. Hayden and H. C. Stephenson.

LIPMAN, BERNARD, D.V.M.
381 Powell St., Brooklyn, N. Y.
Vouchers: P. Olafson and A. G. Danks.

MCKOWN, DONALD C., D.V.M.
Franklin, N. Y.
Vouchers: W. A. Hagan and H. C. Stephenson.

MAJILTON, EDWARD, D.V.M.
52 Day St., Catskill, N. Y.
Vouchers: M. G. Fincher and W. A. Hagan.

MATUSZCZAK, WALTER J., D.V.M.
705 E. Seneca St., Ithaca, N. Y.
Vouchers: H. J. Milks and H. C. Stephenson.

PADDOCK, NICHOLAS MCKIE, D.V.M.
Bath, N. Y.
Vouchers: H. C. Stephenson and A. G. Danks.

PHILLIPS, WEBSTER V., D.V.M.
Amenia, N. Y.
Vouchers: J. N. Frost and H. J. Milks.

PROPER, JOHN S., D.V.M.
c/o W. W. Sheppard, Honeoye Falls, N. Y.
Vouchers: A. G. Danks and H. C. Stephenson.

ROSS, ANDRE LILLIAN, D.V.M.
20 Highland Terrace, Gloversville, N. Y.
Vouchers: H. J. Milks and H. C. Stephenson.

RUEBUSH, E. EDGAR, JR., D.V.M.
Ambassador Animal Hosp., 7931 George Ave., Silver Springs, Md.
Vouchers: H. C. Stephenson and H. J. Milks.

TYMCHYN, VICTOR, J., D.V.M.
R. F. D. No. 2, Altamont, N. Y.
Vouchers: W. H. Kelly and H. C. Stephenson.

ULRICH, C. L., D.V.M.
208 French St., Buffalo, N. Y.
Vouchers: H. J. Milks and H. C. Stephenson.

WOOLFE, DANIEL T., D.V.M.
706 Neck Rd., Brooklyn, N. Y.
Vouchers: H. C. Stephenson and H. J. Milks.

YOUNG, GEORGE A., JR., D.V.M.
302 Mitchell St., Ithaca, N. Y.
Vouchers: R. R. Birch and W. S. Stone.

ZIMMERMAN, THEODORE, D.V.M.
325 W. 93 St., New York, N. Y.
Vouchers: H. H. Dukes and A. G. Danks.

Texas A. & M. College

AARON, EDWARD, D.V.M.
61-38 82nd St., Elmhurst, N. Y.
Vouchers: R. C. Dunn and W. C. Banks.

ALDRIDGE, WM. G., D.V.M.
1201 N. Throckmorton, Gainesville, Texas.
Vouchers: R. C. Dunn and H. L. Van Volkenberg.

BELCHER, WILLIAM ALVIS, D.V.M.
600 E. Gibbs St., Del Rio, Texas.
Vouchers: R. C. Dunn and W. A. Lenert.

BORNSTEIN, SIMON, D.V.M.
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Vouchers: W. C. Banks and R. P. Marsteller.

CARTRITE, H. T., D.V.M.
Sunray, Texas.
Vouchers: R. B. Caraway and R. C. Dunn.

COFFEY, THOMAS H., D.V.M.
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Vouchers: A. A. Lenert and P. W. Burns.

CRIPPEN, DONALD A., D.V.M.
1819 Lyndale Ave., S., Minneapolis, Minn.
Vouchers: A. A. Lenert and R. C. Dunn.

CULPEPPER, RICHARD A., D.V.M.
1323 W. Ashley St., San Antonio, Texas.
Vouchers: F. P. Jaggi, Jr., and R. P. Marsteller.

DICKMANN, HOWARD W., D.V.M.
Perryville, Mo.
Vouchers: J. W. McCoy and A. A. Lenert.

DROLESKEY, ALBERT H., D.V.M.
92-39 219 St., Queens Village, L. I., N. Y.
Vouchers: H. L. Van Volkenberg and P. W. Burns.

DWELLE, EDWARD D., D.V.M.
3220 Lovers Lane, Dallas, Texas.
Vouchers: A. A. Lenert and R. P. Marsteller.

EWALD, P. J., D.V.M.
Box 115, Greenwood, La.
Vouchers: R. B. Caraway and R. P. Marsteller.

GLENN, DUDLEY M., D.V.M.
Box 307, College Station, Texas.
Vouchers: R. B. Caraway and J. W. McCoy.

GRIMES, GEO. M., D.V.M.
Rt. No. 3, Atoka, Tenn.
Vouchers: J. H. Gillmann and R. D. Turk.

GRISSAM, GARNER J., D.V.M.
c/o Dr. J. O. Shannon, Midland, Texas.
Vouchers: R. B. Caraway and J. W. McCoy.

GROSSMAN, ALEX, D.V.M.
1455 Walton Ave., Bronx, N. Y.
Vouchers: F. P. Jaggi, Jr. and W. C. Banks.

HAIGHT, ROBERT H., D.V.M.
Box 454, Balboa Island, Calif.
Vouchers: R. C. Dunn and A. A. Lenert.

HANCOCK, RICHARD M., D.V.M.
Box 68, Acorn Pl., Franklin, Mass.
Vouchers: A. A. Lenert and R. P. Marsteller.

HARGIS, GIFFORD, D.V.M.
Box 157, Colfax, La.
Vouchers: P. W. Burns and R. P. Marsteller.

HAUSER, WILLIAM E., D.V.M.
602 E. Locust St., San Antonio, Texas.
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HAYS, JOHN CAL, D.V.M.
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Vouchers: W. C. Banks and J. W. McCoy.

HOFFER, SAMUEL HARRY, D.V.M.
Box 171, College Station, Texas.
Vouchers: F. P. Jaggi, Jr. and J. H. Milliff.

HOLM, NORMAN, D.V.M.
Bourbon, Ind.
Vouchers: A. A. Lenert and R. B. Caraway.

HULL, JOSEPH S., JR., D.V.M.
604 Webster Ave., West Plains, Mo.
Vouchers: R. B. Caraway and R. P. Marsteller.

JAMES, H. P., D.V.M.
Omaha, Ill.
Vouchers: R. P. Marsteller and P. W. Burns.

JAMES, PHILIP M., JR., D.V.M.
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Vouchers: R. B. Caraway and J. W. McCoy.

JAMESON, HENRY, D.V.M.
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JANAWICZ, ALFRED E., D.V.M.
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JONES, C. K., D.V.M.
Rt. No. 1, Box 290, Corpus Christi, Texas.
Vouchers: G. T. Edds and P. W. Burns.

LANG, JAMES T., D.V.M.
Kurten, Texas.
Vouchers: J. H. Milliff and F. P. Jaggi, Jr.

LAPHAM, R. F., D.V.M.
1701 Genevieve Ave., San Bernardino, Calif.
Vouchers: W. C. Banks and R. B. Caraway.

LICHNOVSKY, J. F., D.V.M.
Nada, Texas.
Vouchers: W. C. Banks and H. L. Van Volkenberg.

MCKEE, JOE B., D.V.M.
Center, Texas.
Vouchers: R. B. Caraway and J. W. McCoy.

MACY, RICHARD D., D.V.M.
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Vouchers: A. A. Lenert and F. P. Jaggi, Jr.

MAIER, M. E., JR., D.V.M.
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Vouchers: J. H. Milliff and R. P. Marsteller.

MARCELLO, CARLO J., D.V.M.
R.F.D., Thibadaux, La.
Vouchers: F. P. Jaggi, Jr. and W. C. Banks.

MORGAN, CLYDE O., JR., D.V.M.
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MYNATT, VERNON S., D.V.M.
4150 Business St., Long Beach, Calif.
Vouchers: H. L. Van Volkenberg and G. T. Edds.

OMMERT, WILLARD DAVID, D.V.M.
464 Hudson St., Oakland, Calif.
Vouchers: A. A. Lenert and R. P. Marsteller.

PARKER, GERALD W., D.V.M.
Rt. No. 5, Corsicana, Texas.
Vouchers: F. P. Jaggi, Jr. and R. P. Marsteller.

PELOT, HARRY H., D.V.M.
P. O. Box 307, College Station, Texas.
Vouchers: R. B. Caraway and R. P. Marsteller.

PICKARD, A. M., D.V.M.
Ladonia, Texas.
Vouchers: F. P. Jaggi, Jr. and R. P. Marsteller.

PINKERTON, J. T., D.V.M.
1509 Earl St., Tyler, Texas.
Vouchers: J. H. Milliff and F. P. Jaggi, Jr.

PUGATCH, NATHAN, D.V.M.
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Vouchers: R. P. Marsteller and H. L. Van Volkenberg.

REA, TED, D.V.M.
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Vouchers: W. C. Banks and R. B. Caraway.

RINEHART, JAMES O., D.V.M.
R.R. No. 7, Box 317, Springfield, Ill.
Vouchers: W. B. Holmes and R. P. Marsteller.

ROGERS, W. T., D.V.M.
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SCHWARTZ, C. L., D.V.M.
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Vouchers: H. L. Van Volkenberg and J. H. Milliff.

SCHWARZENBACH, HOWARD F., D.V.M.
Big Spring, Texas.
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VOGELMAN, LEO, D.V.M.
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WALKER, WESLEY W., D.V.M.
1305 Walnut St., Alameda, Calif.
Vouchers: H. L. Van Volkenberg and F. P. Jaggi, Jr.

LIGGIN, SAMUEL J., D.V.M.
Rochelle, La.
Vouchers: J. W. McCoy and P. W. Burns.

SPARKMAN, CLARENCE M., D.V.M.
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Vouchers: J. W. McCoy and R. P. Marsteller.

Second Listing

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Atkinson, George, 1927 N. Ash, Hutchinson, Kansas.

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Bender, Henry, 615 Topeka Blvd., Topeka, Kansas.

Beyler, Clifford D., R.F.D., Harper, Kansas.

Burkert, Lester H., 508 Walnut St., Valley Falls, Kansas.

Busset, Burson, R.F.D. No. 5, Manhattan, Kansas.

Campbell, T. Clark, Laurel, Neb.

Coates, Albert S., Jr., Box 490—R.F.D. No. 2, Kansas City, Kansas.

Elliott, Dean, R. R., Elmo, Kansas.

Erickson, Robert N., 931 Thurston, Manhattan, Kansas.

Gory, Earl, Rt. No. 1—Box 96, Hoisington, Kansas.

Griffiths, Clayton B., Jr., 1100 E. Haley, Santa Barbara, Calif.

Gurss, Gerald, Burlingame, Kansas.

Handel, Robert T., 1850 Fuller Way, Napa, Calif.

Hentzler, Robert W., 2714 Kansas Ave., Topeka, Kansas.

Hostetler, Clarence, R.R. No. 2, Harper, Kansas.

Kimbell, Kenneth E. C., 401 E. Main, Lyons, Kansas.

Knoche, Ralph W., Adrian, Minn.

Ludwig, A. N., 312 S. 16th, Parsons, Kansas.

Lunt, Donald W., Yankee Hill, Calif.

Messer, Ralph, R.R. No. 2, Lawrence, Kansas.

Mills, Carroll, Blaine, Kansas.

Montgomery, E. L., R.R. No. 2, Parsons, Kansas.

Morris, Olin W., 1709 Anderson, Manhattan, Kansas.

Myers, B. J., Bethel, Kansas.

Nelson, Robert K., 3438 W. 65th Pl., Chicago, Ill.

Quinby, Byron W., 431 Pottawatomie St., Manhattan, Kansas.

Robb, Arthur D., Wamego, Kansas.

Ruf, Jess Wayne, 1107 North C, Arkansas City, Kansas.

Sebree, Lorrain O., Rt. No. 4—Box 234, Kansas City, Kansas.

Sheehey, M. S., Belle Plaine, Kansas.

Short, George E., 1115 Bluemont Ave., Manhattan, Kansas.

Simic, William J., Superior, Neb.

Spencer, R. N., 1400 Shoemaker, Leavenworth, Kansas.

Stoddard, Edward D., 1000 Colorado St., Manhattan, Kansas.

Swenson, Melvin J., Rt. No. 2, Concordia, Kansas.

Symns, J. Caryle, Rt. No. 3, Hutchinson, Kansas.

Thomas, Roy C., 604 N. 29th St., Parsons, Kansas.

Trimble, Monte M., 1709 Cleveland Ave., Kansas City, Kansas.

Upham, Roy W., Rt. No. 3, Junction City, Kansas.

Webb, Lowell M., Beverly, Kansas.

Whiteman, Charles Elmer, Carrollton, Ill.

Wilkins, Lysle M., 1214 Vattier, Manhattan, Kansas.

Wilson, Mark, Laverne, Okla.

Winters, Buford Dale, R.F.D. No. 1, Parsons, Kansas.

Worthman, Robert P., 1234 D St., Lincoln, Neb.

COMMENCEMENTS

Colorado State College

The commencement exercises of Colorado State College were held on Dec. 23, 1942. The following men were graduated with the degree of Doctor of Veterinary Medicine:

Adami, Robert Walter
Ausherman, Robert J.
Beggs, William E.
Bouton, Garrett Nixon
Cooper, Emanuel S.
Costa, Anthony J.
Epling, Glenwood P.
Foster, William McKinley
Gillispie, John Marvin
Green, William Wilson
Henry, Jerrold Newton
Hittle, Harold E.
Kiefer, Ural Kieth
Langridge, John Russell
Lanphear, Paul R.
Leadbetter, Wayne
Ames
McCain, Laurence P.
McElyea, Ulysses
Marcus, Melvin Jacob
Nicholes, Max M.
Ramsay, Lawrence G.
Richards, Robert Booth
Riggs, Charles Willard
Taylor, Howard Clark
Von Tour, Elisha
Watson, George Rudolph
Webb, Jack Howard
Westfall, Ralph David
Williams, Robert Rey
Zontine, William J.

Cornell University

Dean W. A. Hagan of the New York State Veterinary College presented the following candidates for the degree of Doctor of Veterinary Medicine at the commencement exercises of Cornell University on Jan. 28, 1943:

Adolph, W. H., Jr.
Arnaboldi, Allan C.
Becker, Milford E.
Brungot, Norman S.
Burghardt, Harry F.
Cleveland, Howard J.
Conklin, Erwin A.
Dillmann, Eugene
Fisher, Bernard
Gilbert, Edwin O.
Gumaer, Kenneth I.
Halpin, George D.
Haner, Frank H., Jr.
Hokanson, John F.
Hopper, H. Dean
Huckle, John J.
Jenkins, DuBois L.
Kiesel, George K.
Kotchek, Leo
Lanfair, Clyde E.
Larson, Leonard J.
Lewis, Norman Francis
Lindsey, Lionel W.
Lipman, Bernard
McKown, Donald C.
Majilton, Edward
Matuszczak, Walter J.
Paddock, Nicholas McKie
Phillips, Webster V.
Proper, John S.
Ross, Andre Lillian
Ruebush, E. Edgar, Jr.
Tymchyn, Victor J.
Ulrich, C. L.
Woolfe, Daniel T.
Young, George A., Jr.
Zimmerman, Theodore

Kansas State College

At the commencement exercises of Kansas State College on Jan. 23, 1943, Dean R. R. Dykstra presented the following candidates for the degree of Doctor of Veterinary Medicine:

Atkinson, George
Beckenhauer, Neil D.
Bender, Henry
Beyler, Clifford
Burkert, Lester
Busset, Burson
Campbell, T. Clark
Coates, Albert S., Jr.
Elliott, Dean
Erickson, Robert N.
Gory, Earl
Griffiths, Clayton B., Jr.
Gurss, Gerald
Handel, Robert T.
Hentzler, Clarence
Hostetler, Clarence
Kimbell, Kenneth E. C.
Knoche, Ralph W.
Ludwig, A. N.
Lunt, Donald W.
Messer, Ralph
Mills, Carroll
Montgomery, E. L.
Morris, Olin W.
Myers, B. J.
Nelson, Robert K.
Quinby, Byron W.
Robb, Arthur D.
Ruf, Jess Wayne
Sebree, Lorrain O.
Sheehey, M. S.
Short, George E.
Simic, William J.
Spencer, R. N.
Stoddard, Edward D.
Swenson, Melvin J.
Symns, J. Caryle
Thomas, Roy C.
Trimble, Monte M.
Upham, Roy W.
Webb, Lowell M.
Whiteman, Charles E.
Wilkins, Lysle M.
Wilson, Mark
Winters, Buford Dale
Worthman, Robert P.

Agricultural and Mechanical College of Texas

At the commencement exercises of the Agricultural and Mechanical College of Texas on Jan. 22, 1943, R. P. Marsteller, dean of the School of Veterinary Medicine, presented the following candidates for the degree of Doctor of Veterinary Medicine:

Aaron, Edward
Aldridge, Wm. G., Jr.
Belcher, William A.
Bornstein, Simon
Cartrite, Hugh Thomas
Coffey, Thomas Henry
Crippen, Donald Arthur
Culpepper, Richard A.
Curran, Peter Taylor
Dickmann, Howard W.
Droleskey, Albert H.
Dwelle, Edward D.
Ewald, Philip Joseph
Glenn, Dudley McKim
Grimes, George Murray
Grissam, Garner Joe
Grossman, Alex
Haight, Robert Howard
Hancock, Richard M.
Hargis, Gifford
Hauser, William E.
Hays, John Cal
Hoffer, Samuel Harry
Holm, Norman
Hull, Joseph S., Jr.
James, Harry Paul
James, Philip Marion, Jr.
Jameson, Henry Elkan
Janawicz (Jhnatowicz), Alfred Edwin
Jones, Claude Kelly
Lacey, Lee Thomas
Lang, James T.
Lapham, Robert Frazier
Lichnovsky, Joseph Frank
Liggin, Samuel Justis
McKee, Joe Bailey
Macy, Richard Dennis
Maier, Max Edward, Jr.
Marcello, Carlo Joseph
Matheney, Robert G.
Morgan, Clyde O., Jr.
Muller, George H.
Mynatt, Vernon S.
Ommert, Willard David
Parker, Cecil Ward
Parker, Gerald Willard
Pelot, Harry H.
Pickard, Albert M.
Pinkerton, Justin T.
Pugatch, Nathan
Rea, Ted
Rinehart, James Oliver
Rogers, Willie Thomas
Sanders, Oral M.
Schwartz, Charles L.
Schwarzenbach, H. F.
Schweda, Johnnie C.
Sparkman, Clarence M.
Stevens, Earl Henry
Thompson, Charles F.
Tubbs, Charles Russell
Vogelman, Leo
Walker, Wesley Warren

U. S. GOVERNMENT

Use of Rotenone Restricted

A new federal order rigidly restricting the use of rotenone insecticides to certain crops and against certain insects was recently issued. Former Far Eastern sources of supply have been cut and only small supplies are coming from South America.

Finished insecticides now must not contain more than 0.5 per cent of rotenone and must not contain any pyrethrum. Any one who at the end of 1942 had more than 500 pounds of rotenone or 5,000 pounds of rotenone insecticide must report to the War Production Board. Dealers must label or tag all packages sold with a statement of the permitted uses, and every one involved must preserve for two years complete records of all rotenone handled.

Besides certain vegetables, the only other permitted use is on cattle against the cattle grub and short nosed cattle louse. The vegetable uses permitted are on peas against pea weevil and pea aphid, on beans against Mexican bean beetle, and on sweet corn against European corn borer, and on broccoli, brussels sprouts, cauliflower, kohlrabi, mustard, kale, turnips and collards for caterpillars and aphids.

Increased Pay for Bureau Veterinarians

A resolution passed during the closing moments of the Seventy-Seventh Congress provides for a 10 per cent increase of pay, and time and a half for overtime beyond the established 40-hour week. The overtime is computed on only the first $2,900 of the base pay, and provided the base pay and the overtime does not exceed $5,000 a year. Since the Department of Agriculture has adopted a 48-hour week, the Bureau veterinarians will receive eight hours overtime per week. Retirement deductions were not changed and the victory tax is computed on total compensation received. The resolution covers only the short period from Dec. 1, 1942 to Apr. 30, 1943. The new Congress is expected to work out a permanent plan for the increase.

Glossary of Governmental Departments and Services

AAA—Agricultural Adjustment Administration.
AMA—Agricultural Marketing Administration.
ARA—Agricultural Research Administration.
BAE—Bureau of Agricultural Economics.
BEW—Board of Economic Warfare.
CAA—Civil Aeronautics Administration.
CAB—Civil Aeronautics Board.
DHC—Defense Homes Corporation.
DPC—Defense Plant Corporation.
DSC—Defense Supplies Corporation.
EHFA—Electric Home and Farm Authority.
FBI—Federal Bureau of Investigation.
FCA—Farm Credit Administration.
FCC—Federal Communications Commission.
FCIC—Federal Crop Insurance Corporation.
FDA—Food Distribution Administration.
FDA—Food and Drug Administration.
FDIC—Federal Deposit Insurance Corporation.
FHA—Federal Housing Administration.
FLA—Federal Loan Agency.
FPA—Food Production Administration.
FPC—Federal Power Commission.
FSA—Farm Security Administration or Federal Security Agency.
FTC—Federal Trade Commission.
FWA—Federal Works Agency.
GAO—General Accounting Office.
GPO—Government Printing Office.
HOLC—Home Owners' Loan Corporation.
ICC—Interstate Commerce Commission.
MRC—Metals Reserve Company.
NLRB—National Labor Relations Board.
NYA—National Youth Administration.
OC—Office of Censorship.
OCD—Office of Civilian Defense.
ODT—Office of Defense Transportation.
OEM—Office for Emergency Management.
OGR—Office of Government Reports.
OIAA—Office of Inter-American Affairs.
OLLA—Office of Lend-Lease Administration.
OPA—Office of Price Administration.
OSRD—Office of Scientific Research and Development.
OWI—Office of War Information.
PBA—Public Buildings Administration.
PRA—Public Roads Administration.
PWA—Public Works Administration.
REA—Rural Electrification Administration.
RFC—Reconstruction Finance Corporation.
RRC—Rubber Reserve Company.
SCS—Soil Conservation Service.
SEC—Securities and Exchange Commission.
SMA—Surplus Marketing Administration.
SSB—Social Security Board.
SSS—Selective Service System.
TVA—Tennessee Valley Authority.
USES—United States Employment Service.
USHA—United States Housing Authority.
USIS—United States Information Service.
USMC—United States Marine Corps.
WLB—War Labor Board.
WMC—War Manpower Commission.
WPB—War Production Board.
WRA—War Relocation Authority.

Departments and War Agencies

Executive Office of the President—Franklin D. Roosevelt.
State Department—Cordell Hull, Secretary.
Treasury Department—Henry Morgenthau, Jr., Secretary.
War Department—Henry L. Stimson, Secretary.
Justice Department—Francis Biddle, Attorney General.
Post Office Department—Frank C. Walker, Postmaster General.
Navy Department—Frank Knox, Secretary.
Interior Department—Harold L. Ickes, Secretary.
Agriculture Department—Claude R. Wickard, Secretary.
Commerce Department—Jesse H. Jones, Secretary.
Labor Department—Frances Perkins, Secretary.
Economic Stabilization Board — James F. Byrnes, Director.
War Production Board (WPB)—Donald M. Nelson, Chairman.
War Manpower Commission (WMC)—Paul V. McNutt, Commissioner.
Office of Price Administration (OPA)—Prentiss M. Brown, Director.
Office of Defense Transportation—(ODT)—Jos. B. Eastman, Director.
Selective Service—Lewis B. Hershey, Director.
National Food Administration — Claude R. Wickard, Administrator.
National Rubber Administration — Wm. M. Jeffers, Administrator.
National Petroleum Administration—Harold L. Ickes, Administrator.
Lend-Lease Administration—E. R. Stettinius, Jr., Administrator.
Board of Economic Warfare—Milo Perkins, Executive Director.
Office of War Information—Elmer Davis, Director.
Office of Censorship—Byron Price, Director.

Meat Inspectors Wanted

As the number of meat packers engaged in interstate trade increases, the demand for meat inspectors likewise mounts. The United States Civil Service Commission is offering positions as lay inspectors to persons who have had at least four years of experience in farming and applications will be accepted un-

—U. S. Army Signal Corps Photo

That the training of dogs is not just a phantom is shown in this Signal Corps picture taken at the training quarters for dogs at Camp Robinson, Ark. Contribution of Buddy Anderson, formerly of the AVMA office.

til the needs of the service have been met. The salary is $1,620 a year. Persons employed on livestock, poultry, and dairy farms are not acceptable owing to manpower shortage in those fields, the announcement declares. [With these exemptions in sight, just who is the potential lay meat inspector whom the government seeks? Certainly men experienced in the meat trade would make better timber than a farmer not involved in livestock, poultry or dairying.]

Announcement 276 for Lay Inspectors, obtainable from the Commission, contains all the desired information.

Point Rations are Fair is the title of a circular of the Office of War Information setting forth that in allocating one-fourth of the total food supply to the Army, the reason for even distribution of the remaining three-fourths is apparent. When money is plentiful, most people would buy more food than they actually need. Point rationing prevents this since it covers both abundant and scarce foods, and the latter requires more points than the others. The buyer who cannot get what he wants in one kind of food cannot raid another kind without being penalized in points. Most Americans are reconciled to the restriction. None will suffer from want and none will be able to gloat.

State Board Examinations

Alabama—The Alabama Veterinary Medical Examining Board will have a special called meeting in the old veterinary building, March 5-6, 1943, Auburn, Alabama, for the purpose of holding examinations for obtaining licenses and transacting such other business as may come before the Board.

West Virginia—The West Viriginia Veterinary Board will convene at the Daniel Boone Hotel in Charleston, Kanawha County, West Va., Apr. 5, 1943, at 9 a. m., for the purpose of holding examinations in veterinary medicine. All applications must be in the hands of the Secretary not later than March 15. For further particulars, address: W. E. Trussell, Secretary, Charles Town, Jefferson County, West Va.

Massachusetts—The Massachusetts State Board of Veterinary Examiners will hold examinations for registration in veterinary medicine May 18-19, 1943 at the State House, Boston, Mass.

AMONG THE STATES

Australia

No Newcastle Disease in Australia

Chief Max Henry, B.V.Sc., M.R.C.V.S., Sidney, Australia writes:—"In your issue of September, 1942, page 211, you include a paragraph entitled *New Castle Disease* in poultry. In that paragraph you refer to that disease as existing in Australia. It is now many years since Newcastle disease existed in this country. It gained access into Victoria but energetic action taken by the veterinary service resulted in its complete eradication and prevented the spread to other states."

California

State Association.—The California Veterinary Medical Association, in coöperation with the California State Polytechnic School, presented the following program at the annual short course held at the School, Jan. 4-6, 1943.

W. S. Gochenour, Indianapolis, Ind., biological division, Pittman-Moore Co.: "Biologics Essential to the War Effort" and "Feline Distemper."

Kenneth McKay: "County Organization on a Voluntary Basis to Reduce Brucellosis."

C. M. Haring: "Recent Bovine Brucellosis Experiments."

Charles Reid: "Mummified Foetus and Extrauterine Pregnancy in the Mare." Discussion led by J. Farquharson.

J. Farquharson, Colorado State College: Motion Pictures of Surgical Procedures and "Anesthasia in Large Animals" and "Pulmonary Diseases of Cattle."

C. W. Bower, Topeka, Kans., president-elect of the AVMA: "Diseases of Old Dogs" and "The Veterinary Profession Marches in Review."

E. E. Leasure, Kansas State College: "Sheep Scab"—film.

W. H. Boynton: "New Method of Diagnosing Hog Cholera."

B. B. White: "Importance of the Control of Swine Diseases in the Present Emergency."

F. W. Wood: "Swine Erysipelas."

W. R. Hinshaw: "The Rôle of the Veterinarian in the Control of Turkey Diseases."

M. A. Stewart, associate professor of entomology, University of California: "Parasites and Their Control by Phenothiazine."

Pioneers.—Comes a letter from southern California reminding the JOURNAL that the 1891 class of the Chicago Veterinary College furnished that state with Tyler, Spencer, Fox and Archibald, all pioneers and prominent figures in national organized veterinary medicine. Within two years after graduation of this class, California had its first veterinary practice act and one of the class (Archibald) became president of the AVMA.

Connecticut

State Association.—The Connecticut Veterinary Medical Association held its annual meeting in Hartford on Feb. 3, 1943. The following officers were elected: John A. Rathbone, New London, *president;* Jean V. Smith, S. Norwalk, *first vice-president;* J. Wm. Watt, West Haven, *second vice-president;* and George E. Corwin, Hartford, *secretary-treasurer.*

District of Columbia

Celebrates 125th Anniversary.—The Medical Society of the District of Columbia, founded in 1817, celebrated its 125th anniversary in Washington, Dec. 9, 1942. Among the guests were President A. E. Wight, of the District of Columbia Veterinary Medical Association, past president of the AVMA, and chief of the Division of Tuberculosis Eradication of the Bureau of Animal Industry. One of the principal speakers was Dr. Frank H. Lahey, past president of the American Medical Association.

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District of Columbia Association.—The District of Columbia Veterinary Medical Association held the first quarterly meeting Jan. 26, 1943, at the Mayflower Hotel. The following films were shown: "Treatment of Chronic Mastitis"; "Immunization Against Infectious Diseases"; "Their Safety is Your Trust", a short procured from the P. D. S. A., London, England.

The officers elected for the year were: Lt. Col. Charles S. Greer, *president;* C. Kenneth Francis, *first vice-president;* D. I. Skidmore, *second vice-president;* W. M. Mohler, *secretary-treasurer* (reëlected). The Association nominated L. T. Giltner to serve as AVMA resident secretary of the District of Columbia for two years. Mason Weadon was elected delegate and Irving M. Cashell alternate to represent the district of Columbia in the House of Representatives for 1943-44.

S/WM. M. MOHLER, *Secretary.*

John R. Mohler Receives Alumni Award

At the twenty-eighth Founder's Day celebration of the University of Pennsylvania, Jan. 16, 1943, John R. Mohler, chief, U. S. Bureau of Animal Industry, was one of eight alumni chosen to receive the Alumni Award of Merit.

John R. Mohler

Following is the citation:

JOHN ROBBINS MOHLER, 1896 V. M. D., 1925 Sc.D., (hon.) Chief of the Bureau of Animal Industry of the United States Department of Agriculture, translator, editor, author, president of several medical and veterinary societies and the International Veterinary Congress, your assistance in maintaining research in the School of Animal Pathology at the University of Pennsylvania has been of great service.

Illinois

Drive Against Brucellosis.—Pursuant to a circular issued in December by the extension and animal pathology departments of the state university, veterinarians in the spirit of stepping up swine and milk production are bent on systematic control of brucellosis in cattle and swine. Federal Veterinarian Kuttler, State Veterinarian Fiddler, and Chief Graham of the university's veterinary service are coöperating with good results in putting animal-disease control on a more workable basis than in former years when teamwork was lacking. Evidence of the new order was outwardly expressed at the meeting of the state association and of the association of state veterinary employees in January.

The circular (*l.c.*) points out the high incidence of brucellosis and outlines the plan of attack. Of 2,000 samples of swine blood examined, 10 per cent were positive for brucellosis. Testing herds, removing reactors (sows and boars), quarantine of newcomers from nontested herds, cleaning premises, frequent retesting, and reminding breeders of the public health phase and of the advantage of brucellosis-free herds are stressed in the plan of control.

Indiana

The following are Indiana veterinarians who are now serving in the armed forces of the country:

M. C. Abraham, Eaton, Ohio.
B. V. Allen, Fort Wayne.
Ben Blood, Wabash.
F. E. Broad, Plymouth.
E. F. Brown, Manilla.
Kenneth Burns, Milan.
Hugh B. Campbell, Geneva.
H. L. Decker, College Corner, Ohio.
W. R. Fetzer, North Liberty.
Murl Fox, Aurora.
L. M. Friedline, Jonesboro.
W. G. Galloway, LaFayette.
R. B. Gochenour, Indianapolis.
Wm. S. Gochenour, Jr., Indianapolis.
H. A. Gorman, Auburn.
R. J. Hoskins, Indianapolis.
Roscoe Hyde, Hartford City.
W. W. Jackson, Greenfield.
P. C. Kucher, Fort Wayne.
Wm. H. Lindley, Lawrenceburg.
H. F. Lopp, Salem.
John H. Martin, North Manchester.
M. E. Moore, Alexandria.
R. E. Nichols, Purdue University.
E. F. Pringle, Goshen.
E. W. Spieth, Jeffersonville.
D. S. Steele, Indianapolis.
Carl C. Tucker, Claypoole.
N. A. Turner, Wabash.
R. W. Wann, Wingate.
W. E. Welbourn, Winchester.
R. M. Zirkle, Garrett.

S/CHARLES C. DOBSON, *Secretary.*

Iowa

B.A.I. Office Moved.—Writes J. A. Barger, B.A.I. veterinarian in charge in Iowa: "The office of the Bureau is being moved to Suite 301, Old Colony Building (Des Moines) where all communications in the future should be addressed." The Old Colony Building is located at 10th and Grand.

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Eastern Iowa Association.—The Eastern Iowa Veterinary Medical Association executive board held a meeting on Jan. 14, 1943 in the Hotel Montrose, Cedar Rapids. Treasurer A. R. Menary of Cedar Rapids was instructed to purchase a $100.00 War Bond and contribute to the Red Cross drive. A proposal to hold a clinic in 1943 was voted down due to wartime uncertainties. The date for the thirtieth annual meeting was set for Oct. 12-13, 1943, in Cedar Rapids.

Funds were set aside for the continuation and extension of the Association's year-round activities in connection with infectious livestock disease control, and the reporting of outbreaks of this disease to the press. E. S.

Dickey, Ottumwa, urged veterinary coöperation in the control of trichinosis in swine, warbles in cattle and nodular disease in sheep.

President Moles appointed the following as members of the Policy Committee for 1943: H. E. Tyler, New London, *chairman;* C. M. Collins, Ottumwa, *secretary;* Iva Dunn, Atkins; Jerry Wolfe, Grand Mound; R. P. Helming, Cresco; C. C. Graham, Wellsburg.

The following are members of the Advisory Committee for 1943: V. G. Bromwell, Center Point, *chairman;* M. C. Larson, Keystone, *secretary;* C. A. Bradley, Marion; C. L. Crider, Elkader; Laurence P. Scott, Waterloo; Chas. E. Bassler, Ainsworth; O. E. Juhl, Osage; L. W. Kellogg, Anamosa; and F. E. Brutsman, Traer.

Kansas

Comes a notice from the dean of the School of Veterinary Medicine, Kansas State College, R. R. Dykstra, which we quote:

> During the emergency the School of Veterinary Medicine, Kansas State College, will begin its annual sessions about June 1, 1943, instead of September 1, as formerly. The 1943 session, for example, will start May 31, 1943. Enrolled students in the professional curriculum in veterinary medicine must be prepared to attend each year three terms of 16 weeks each. A total of eight terms or tri-mesters will permit completion of all requirements for the degree in veterinary medicine. Entrance to the prosessional curriculum continues to be one year or more of approved pre-veterinary work. Those desiring to enroll should send for an application blank to R. R. Dykstra, Dean, School of Veterinary Medicine, Kansas State College, Manhattan, Kans.

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State College.—The Kansas State College Research Foundation has been organized with President Farrell as chairman of a board of nine members. The purposes are the same as those of a number of other land-grant colleges —the promotion of scientific research.

Kentucky

Additional information has come to us concerning the death of Frank Hare (K.S.C., '20), reported in our last issue, who died Nov. 26, 1942, in Lexington, Ky., at the age of 49 years. He met his death in an accident at a railroad crossing in which his car was demolished. Dr. Hare had practiced in Lexington for the past 11 years, specializing in diseases of horses.

Born in Dawn, Mo., Sept. 2, 1893, Dr. Hare served in the Army during World War I. For three years, he was in charge of the experiment station in Santo Domingo, where he introduced American breeds of cattle to the island and worked out improvements in feeding, crop rotation, and disease control. He became a member of the AVMA in 1922.

Dr. Frank Hare

Maine

State Association.—The meeting of the Maine Veterinary Medical Association was held Jan. 13, 1943 at the hospital of P. R. Baird, Waterville. The afternoon clinic under the leadership of Dr. Baird and his assistant, R. E. Ingham, included an operation to correct an inguinal hernia in a pig, performed by R. B. Larcom of Kittery and E. C. Moore of Lewiston. R. E. Ingham demonstrated cases of skin lesions in the dog and cat, and malnutrition, anemia and parasitism in pups.

The following officers were elected for the year: A. E. Coombs, Skowhegan, *president;* Lawrence Batchelder, Presque Isle, *vice-president;* J. F. Witter, Orono, *secretary-treasurer.* L. B. Denton, Caribou, was elected as the association's nominee for resident state secretary for 1943-44.

A dinner followed at the Elmwood Hotel in honor of C. F. Dwinal (Am. V. C. '92) Bangor, in recognition of his fiftieth year in practice. Dr. Dwinal has been in active practice longer than any other veterinarian in the state, and was one of the organizers of the state association. The speakers at the dinner included:

C. D. Cromsell, M.D., Superintendent of the Maine Central Sanitarium.

James Glover, attorney-at-law: "Veterinary Jurisprudence."

S. D. Merrill, S. Paris: "The Use of the Sulfonamides in Veterinary Practice."

P. R. Baird: Sulfonamide-in-Oil for Treating

Mastitis", and "The Control of Feline Distemper. The next meeting was tentatively arranged for April 14, 1943.

s/J. F. WITTER, *Secretary.*

Massachusetts

State Association.—The annual meeting of the Massachusetts Veterinary Medical Association was held at the Hotel Vendome, Boston, Jan. 27, 1943. The following officers were elected: E. A. Woelffer, Boston, *president;* Osman Babson, Gloucester, *first vice-president;* F. M. Austin, Belchertown, *second vice-president;* and H. W. Jakeman, Boston, *secretary.*

The following program was presented:

E. R. Frank, Kansas State College: "Bovine Surgery," a technicolor film.

Bayard Tuckerman, Jr., a former member of the Governor's Council and volunteer with the American Field Service in Africa: "Experiences of My Recent Trip to Africa."

C. P. Zepp, New York City: "Prevalent Gastro-Intestinal Diseases of the Dog."

L. A. Paquin, Webster, was officially elected as the nominee of our association for AVMA resident state secretary, with the understanding that the appointment is to be made by the president-elect, becoming effective at the beginning of the next AVMA year.

s/H. W. JAKEMAN, *Secretary.*

Michigan

Post-Graduate Conference for Veterinarians.—The Veterinary short course at Michigan State College was held Jan. 25-29, 1943. The laboratories of clinical pathology and the Central Brucella Station were open to visiting veterinarians for indirect tests for streptococcic mastitis, as was the poultry clinic for observations upon various poultry diseases. Following are the speakers and their subjects:

Cliff D. Carpenter, Ft. Wayne, Ind.: "Vitamins on Parade" (illustrated). Dr. Carpenter also discussed the "Poultry War Effort."

C. W. Bower, Topeka, Kans., president-elect of the A.V.M.A.: "The American Veterinary Medical Association and the War."

P. J. Schaible, Michigan State College: "Wartime Poultry Feeding."

C. A. Brandly, Regional Poultry Laboratory, East Lansing: "Poultry Mortality Reduction."

Harold Anderson, dairyman, Anderson Certified Dairy, Maumee, Ohio: "Mastitis as Viewed by the Dairy Owner."

Donald W. Baker, Cornell University, Ithaca, N. Y.: "Parasites in Sheep, Cattle and Horses."

F. E. Stiles, Battle Creek: "Sheep Diseases Other Than Parasites."

L. P. Doyle, Purdue University, Lafayette, Ind.: "Swine Enteritis and Swine Erysipelas."

Frank Thorpe, Jr., and C. F. Clarke, both of the animal pathology department, Michigan State College: "Sheep Pneumonia and Experience with Tissue Vaccine."

C. W. Darby, Michigan State College: "Field Diagnoses of Pullorum Disease."

C. H. Clark, Michigan State Veteriarian: "The 1942 Outbreak of Equine Encephalomyelitis in Michigan."

Harry Moxley, Michigan State College: "The Present and Future Horse Outlook."

H. R. Smith, general manager, National Livestock Loss Prevention Board, Chicago, appealed to veterinarians to do all in their power to exterminate nodular worms in sheep by using phenothiazine, in order to make available more sheep intestines for the manufacture of surgical sutures.

C. F. Huffman, Michigan State College: "Minerals and Vitamins."

W. L. Mallman, Michigan State College: "Newer Disinfectants."

s/John P. Hutton.

• • •

Illegal Practitioner Enjoined.—After acquittal by a justice of the peace, for having vaccinated cattle against brucelloses without a license to practice veterinary medicine, Arthur J. Morgan, of Clare, was enjoined from continuing to violate the state veterinary practice act by Circuit Judge Ray Hart. The injunction, dated Jan. 2, 1943, reads:

> Now, therefore, it is ordered, adjudged, and decreed that Arthur J. Morgan, the above defendant, be and hereby is, enjoined and restrained from vaccinating cattle for Bang's disease, from treating livestock for disease and ailments, and from engaging in the practice of veterinary medicine.
>
> s/RAY HART, *Circuit Judge.*

Writes Secretary B. J. Killham of the State Association: After the justice court trial, the defendant received a two-column write up in the local paper and hence became somewhat famous. The defendant was then taken to the circuit court and the injunction was secured after quite a battle.

New Jersey

Compliments Bovine Tuberculosis Eradication.—Says the New Jersey Tuberculosis League, Inc., in its fall (1942) Bulletin:

"In the state's large milk producing areas, residents readily recall the triumphantly concluded fight against bovine tuberculosis. Dairy men today can point with great pride to tested herds which are free from any trace of infection. In this state they know that enforcement of legislation enacted three years ago has made the schools as safe as the stables. They are enthusiastic in their expression of approval of the present tuberculosis campaign which aims to protect the home and com-

munity and is guarding the country's armed forces from an enemy more deadly than Jap or Nazi.

"New Jersey residents will note with special interest in connection with the triumph of bovine tuberculosis that Dr. Theobald Smith, who pioneered in the research on which was based much of the campaign methods, lived and worked for many years at Princeton and was an honored member of national and state tuberculosis association boards."

• • •

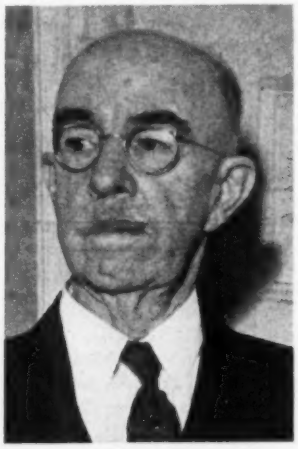
The Veterinary Medical Association of New Jersey.—The Veterinary Medical Association of New Jersey again took an active part in the proceedings of Agricultural Week, sponsoring a livestock and dairy program on Jan. 28, 1943, which was well attended. The speakers were:

R. R. Birch: "Diseases of Swine."

John S. Gray: "The More Common Ailments of the Dairy Animal."

• • •

W. F. Harrison (Am. V. C. '87) was one of three designated by the State Board of Agriculture for citation, recognizing his outstanding and valuable contributions as one interested in the welfare of New Jersey farm life. Dr. Harrison's citation follows:



W. F. Harrison

New Jersey agriculture has been benefited immeasurably by your loyal service of over a half a century in your chosen profession, the practice of veterinary medicine.

Your training and wide experience have especially fitted you for an active part in protecting the health of the animal population of our state, safeguarding a leading source of our farm income.

Your loyal coöperation in furthering the disease control programs of the State Department of Agriculture has contributed much to the successful conclusion of these projects. Although a veteran practitioner, you always have been among the first in your profession to adopt the latest findings of science.

You have won the regard of our farmers and you have upheld the dignity of your profession, promoting thereby not only your own sphere of usefulness but that of the science you practice.

This Citation for Distinguished Service to New Jersey Agriculture is awarded in commendation of your years of faithful and skillful practice.

J. R. PORTEUS, *Secretary.*

New York

"Use the Veterinarian."—The following from The Farm Bureau News Letter of Rockland County, New York, is quite a contrast from clippings we receive from similar publications of the Middlewest, where complaints on unfair and antiscientific methods of local farm bureau representatives keep piling up. Illinois and Iowa veterinarians, particularly, are incensed at the harm farm bureau agencies are inflicting on legitimate methods of building up the nation's food resources.—Ed. We quote:

"There are about one and one-half million dairy cows in New York state not counting the heifers and calves, which must be kept healthy and producing to full capacity. While most of these cows are healthy and sound, there is no telling when something like this case of milk fever just cited, may develop to cause trouble. It is then that the help of the veterinarian is needed, and needed badly if the cow is to be saved.

"Veterinarians are Specialists.—Sometimes I think a good many dairymen do not use their veterinarian as much as they should. Often, men like to try their hand at doctoring and many times for certain ailments they do pretty well. However, there are many cases which require specialized training which most dairymen do not possess. It is the veterinarian's business to treat sick animals just as it is the dairyman's business to produce milk. Both are specialists in their particular fields.

"In New York state, we are fortunate to have most of our dairy sections well served by veterinarians. These men, in most instances, are performing valuable and conscientious service which dairymen appreciate. A good veterinarian in a locality saves the livestock and dairy industry nobody knows how much each year, but the sum must be great.

"Use Veterinarians Regularly.—I believe your veterinarians should be consulted as frequently when the herd is healthy as when the herd is sick. In other words, we should use our veterinarian more than we commonly do to help us keep out of trouble instead of only employing him "to pull us out" after we have

a bad disease outbreak. It is my understanding that in some localities, herd owners have arranged with their local veterinarian to supervise the health of their herds through regular visits. The veterinarian makes a careful survey of the herd's health and advises the farmer how best to manage the herd to keep it healthy and in sound producing condition. He also cares for the animals which from time to time may require veterinary aid. Such a regular, herd-health service is the sort of thing which needs to be developed to a greater extent. The emphasis is then placed right where it belongs—upon health and prevention instead of upon disease and cures.

"If you have a veterinarian in your community, get acquainted with him and seek his advice and counsel upon your health and disease questions. It will pay you well to do so. Herds must be kept healthy if they are to be most profitable and most productive."

• • •

Veterinary Medical Association of New York City.—The regular monthly meeting of the Association was held in the Hotel New Yorker, Feb. 3, 1943. The speaker of the evening was: **Thomas A. Gonzales,** M.D., chief medical examiner of New York City, and his subject, "Some Problems in Legal Medicine." The lecture was illustrated.

Films were shown illustrating "Spontaneous Allergy (Atopy) in the Lower Animals." F. W. Wittich, M.D., of Minneapolis, Minn., edited and produced the film.

Dr. Hagan was announced as the speaker for the March meeting, his subject to be "Viruses and Virus Diseases."

s/C. R. Schroeder, *Secretary-treasurer.*

North Carolina

Annual Conference.—The fifth annual veterinary conference of the North Carolina Veterinary Medical Association, with the State College coöperating, was held Jan. 26-29, 1943 at the North Carolina State College, Raleigh. The program presented at the conference follows:

R. S. Dearstyne: Resume of North Carolina's Poultry Industry.

R. E. Greaves: "Avian Coccidiosis."

H. C. Gauger: "Turkey Diseases."

D. W. Gregory: Infectious Coryza and Other Infectious Respiratory Conditions of Fowls."

W. W. Dimock: "Horse and Mule Production."

D. H. Udall: "Gastrointestinal Diseases of Bovines," and "Dairy Inspection."

J. A. Campbell: "Canine Dystocia and Its Treatment."

William Moore: "Progress Demands that we Retain our Present Gains in the Prevention and Control of Disease."

Henry Kohn: "The Action of the Sulpha Drugs on Bacteria," followed by a discussion.

A film entitled "Horse Production and Racing in Kentucky," was shown.

At the business session of the State Association Jan. 27, 1943, A. A. Husman, Raleigh, was unanimously reëlected delegate to the AVMA House of Representatives, and J. H. Brown, Tarboro, alternate.

Pennsylvania

Veterinary Conference.—Attendance at the University of Pennsylvania Conference, January 5-6, 1943, was especially good, about 130 veterinarians being registered. The speakers and their subjects included:

B. T. Simms: "Recent Studies in the Control of Gastro-Intestinal Parasites in Large Animals," and "Bovine Coccidiosis."

W. W. Dimock: "Breeding Problems, Care and Management of Horses."

M. A. Emmerson: "X-Ray Therapy."

L. A. Klein: "Therapeutic Review of Some of the Sulphonamides."

J. J. Thomas: "The Meat Hygiene Service in Pennsylvania."

David Coffin: "The Diagnosis of Canine Leptospirosis."

Herman R. Seibold: "The Importance of Laboratory Aid in Establishing Diagnosis in General Practice."

Two motion pictures were shown, "Horse Production and Racing in Kentucky" and "Summer Eczema in Dogs."

• • •

The senior class at the School of Veterinary Medicine, University of Pennsylvania, has protested to motion picture officials in Hollywood the deplorable insinuations made regarding the veterinary practitioner in the picture "White Cargo."

• • •

State Association.—Officers elected at the sixtieth annual meeting of the Pennsylvania State Veterinary Medical Association last fall are as follows: C. P. Bishop, *president;* M. W. Allam, *first vice-president;* L. Peterson, *second vice-president;* E. S. Pickup, *third vice-president;* E. T. Booth, *treasurer;* J. D. Beck, *corresponding secretary;* J. F. Shigley, F. H. Schneider, E. W. Hogg, M. E. Patrick, and H. B. Prothero, *board of trustees.* The resignation of W. H. Ivens, Sr., on account of his illness, who has served long and faithfully as treasurer, was accepted with regret.

The following resolution was adopted at the foregoing annual meeting:

Whereas, it has been brought to the attention

of the membership of the Pennsylvania State Veterinary Medical Association that an effort may be made at the next session of the General Assembly of the State of Pennsylvania to weaken existing biological and virus laws, and

Whereas, any such proposals will jeopardize continued maintenance of good health among our domestic animals and vigilant control of infectious disease in man as well, and

Whereas, the protection of the health of the citizens and domestic animals in the state of Pennsylvania is of paramount necessity particularly in the present critical war situation, now, therefore,

BE IT RESOLVED that the Pennsylvania State Veterinary Medical Association hereby, unanimously and vigorously, opposes any such weakening of the present biological and virus laws and pledges its active support to such opposition.

s/RAYMOND C. SNYDER, *Secretary.*

Personals

Wm. H. Ivens, Sr., Executive Board member for District No. 11 whose prolonged illness prevented his attendance at the seventy-ninth annual meeting of the AVMA and the sixtieth annual meeting of the state association, is reported as improved.

S. F. Scheidy, formerly connected with the veterinary school of the University of Pennsylvania as research associate in bovine mastitis and instructor in veterinary medicine, has been appointed director of Veterinary Clinical Research in the medical research division of Sharp and Dohme.

Tennessee

The treasurer of the A. V. M. A., M. Jacob (U. of Pa. '99) was selected by the Pennsylvania Gazette, January, 1943 issue, as one of four prominent Pennsylvanians to appear on their page set aside for prominent alumni. Following is the Gazette's account of Dr. Jacob's endeavors since graduation:

M. Jacob

Dr. M. Jacob, '99 V., was the recipient of the J. B. Lippincott Award upon graduation and served as house surgeon in the veterinary hospital until 1900. He established his practice in Knoxville, Tenn., and entered the faculty of the University of Tennessee. In 1904, he became professor of veterinary practice at Iowa State College. Returning to the University of Tennessee as professor of veterinary science, he served as state veterinarian until 1921, when he was appointed head of the animal husbandry department at the University. In 1937, he became dean of the College of Agriculture, University of Tennessee. Dr. Jacob has held many distinguished posts in his profession.

• • •

Personal.—The 6-year-old son, Billy, of H. W. Hayes, Tazewell Pike, died in January, 1943. Their friends are deeply grieved.

s/D. Coughlin.

Texas

State Association.—The eighteenth semi-annual meeting of the Veterinary Medical Association of Texas was held Jan. 26, 1943 at the Veterinary Hospital, College Station, Texas. Twenty-three applicants were duly elected as members of the Association.

W. G. Brock reported on the classification of veterinarians now in Texas and pointed out the small number of veterinarians now in practice in the state. Dr. Brock also discussed the proposed amendment to the Veterinary Practice Act now before the legislature, which will allow graduates of two-year veterinary schools to take the state board examinations.

The new proposed narcotic bill was also discussed. This bill will allow paregoric to be sold only on prescription.

It was voted to increase the size of *The Texas Veterinary Bulletin.*

The next meeting of the Association will be held at College Station soon after the graduation of the next class, which will be sometime in September, 1943.

The new officers elected were: Dan Roberts, Wichita Falls, *president;* Charles Koberg, San Angelo, *first vice-president;* W. M. Smotherman, Huntsville, *second vice-president;* E. W. Wupperman, Austin, *secretary-treasurer.*

Utah

Livestock Sanitary Association.—The Intermountain Livestock Sanitary Association held a round table discussion on Jan. 23, 1943, followed by a banquet for the veterinarians and their wives. The program presented follows:

J. I. Curtis: Round table discussion on Brucellosis.

W. T. Huffman: "Poison Plants."

W. H. Hendricks: "Respiratory Diseases of Poultry."

Hugh Hurst: "Poultry Evisceration."

R. S. Swalberg: "Large Animal Practice."

Wayne Binns: "Requirements of Veterinarians in the Army."

R. S. Cooley: "U. S. Pure Food and Drug Act."

Washington

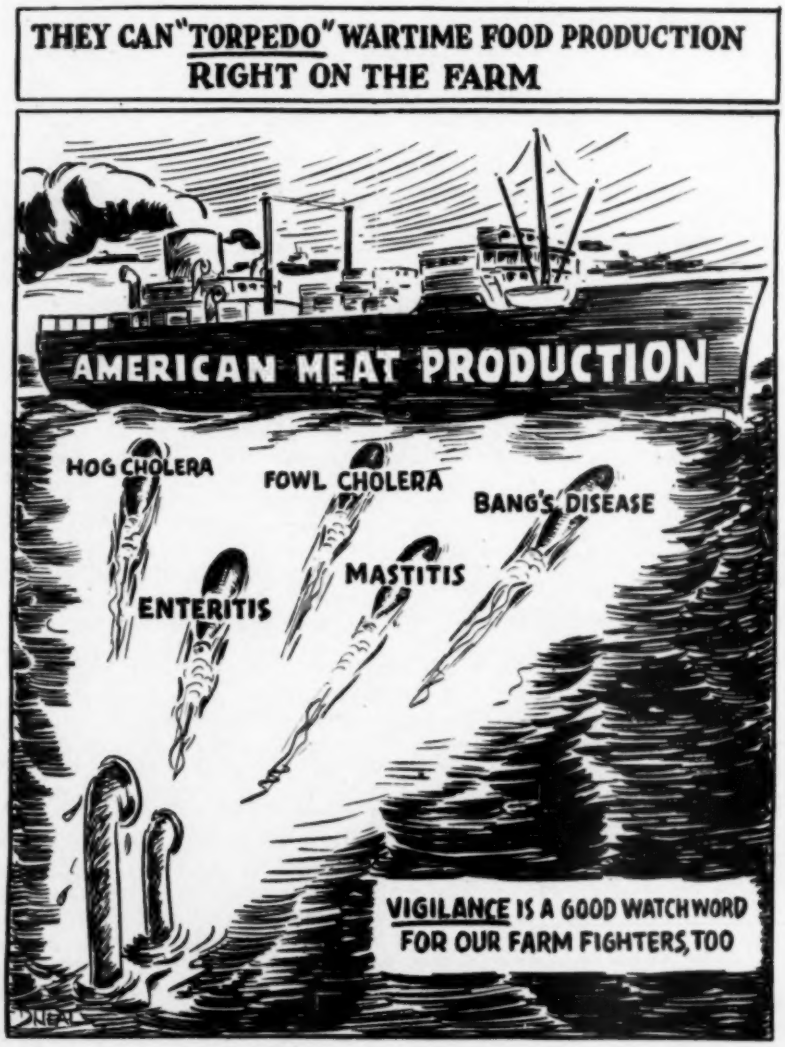
The Veterinary College of Washington State University at Pullman has moved into its new buildings with very little interruption in their class work. The articles of incorporation of the Washington State Veterinary Medical Association were accepted on Nov. 6, 1942.

s/J. L. ELLIS, *Resident State Secretary.*

Stanton Youngberg May Be Alive

Dr. B. F. Hadley, Madison, Wis., sends a letter from Associate Editor Harriet Daily Collins of the Ohio State University Monthly which states that the announcement of Dr. Youngberg's death was but a rumor based upon the probable mistaking of "interned" for "interred", contained in the report received by a brother of Mrs. Youngberg. The exact fate of Dr. and Mrs. Youngberg is, however, not known. They were in Manila at the time of Japanese occupation of that city last March.

Dr. Youngberg, onetime director of agriculture in the Philippines, came back to the United States when that insular possession was turned over to the new government, but in 1939 he returned to the Philippines as a member of the Mindanao Commission, a rehabilitation project.



From the Foundation of Animal Health

COMING MEETINGS

Southeastern Michigan Veterinary Medical Association. Meeting at 3919 John R. Street, Detroit, Mich., March 10, 1943. F. D. Egan, 17422 Woodward, Detroit, Mich., secretary.

Connecticut Veterinary Medical Association. Bond Hotel, Hartford, Conn., May 5, 1943. Geo. E. Corwin, 19 Frederick St., Hartford, Conn., secretary-treasurer.

Michigan State Veterinary Medical Association, June 22-23, 1943.

Eastern Iowa Veterinary Medical Association. Hotel Montrose, Cedar Rapids. Oct. 12-13, 1943. R. E. Elson, Vinton, secretary.

Meetings Postponed or Cancelled

Houston Veterinary Medical Association. Archie Stallings, 801 Waugh Drive, Houston, Texas, secretary. Meetings for the Houston Association have been postponed for the duration.

South Dakota Veterinary Medical Association. J. T. McGilvray, R. R. No. 3, Sioux Falls, S. Dak., secretary-treasurer. Meetings for the South Dakota Association have been postponed for the duration.

Virginia State Veterinary Medical Association. E. P. Johnson, Box 593, Blacksburg, Va., secretary. Winter meeting cancelled.

Wisconsin Veterinary Medical Association. B. A. Beach, University of Wisconsin, Madison, Wis., secretary. Annual (winter) meeting cancelled.

Mississippi Veterinary Medical Association. H. C. Simmons, secretary-treasurer. The 1943 meeting has been postponed indefinitely.

BIRTHS

To Major (Wash., '39) and Mrs. Fernley W. Duey, Camp Adair, Ore., a son, Michael Wood, Jan. 16, 1943.

To Dr. (Iowa, '41) and Mrs. A. M. Orum, Carthage, Ill., a daughter, Judith Ann, Jan. 18, 1943.

MARRIAGES

Lt. Maurice H. Borer (T.A.&M., '41) of Morrison Field, West Palm Beach, Fla., to Shirley Schwartz, at Miami Beach, Fla., Nov. 3, 1942.

DEATHS

Wm. Patrick Collins (McK., '05), 64 years old, died at his home in Washington, D. C., Jan. 21, 1943, after a protracted illness. He was well known in the East, specializing in the diseases of thoroughbreds and small animals. He maintained a small animal hospital in Washington for more than thirty years. From 1917 to 1923, he was professor of surgery at the U.S.C.V.S. He joined the AVMA in 1918.

Alfred G. Gierke (N.Y.S.V.C., '17), 49 years old, died Nov. 29, 1942, at Alturas, Calif. Dr. Gierke served in the Army in World War I, after which he engaged in private practice and later in official disease control work and teaching in New York state. He was in charge of the pathological laboratory of the California State Department of Agriculture, Division of Animal Industry, at Sacramento, from 1929 to 1937, when ill health forced him to retire.

John C. Hargrave (McG. U., '95), Medicine Hat, Alta., Can., died Oct. 15, 1942. He was associated with the Health of Animals Bureau. He had been a member of the AVMA since 1902.

George A. Johnson (I.S.C., '86), honor roll member of the AVMA, died in retirement at Orlando, Fla., Feb. 3, 1943. He was 80 years old, joined the Association at the Chicago meeting of 1890, and for many years took active part in its administration and programs. He held important posts in the United States Bureau of Animal Industry which he joined soon after graduating. The later years of his professional life were devoted to commercial biological production in Kansas City. Mrs. Johnson, to whom the Doctor was married for fifty-two years, died Oct. 24, 1942 (*vide*, the JOURNAL, Dec. 1942, p. 632).

Frank Foster McNeely (K.C.V.C., '17), 51 years old, Colfax, La., died April 24, 1942. He had been associated with the U. S. Bureau of Animal Industry. He was a member of the Louisiana Veterinary Medical Association. He joined the AVMA in 1938.

D. S. Tamblyn (McG. U. '01), 63 years old, Kingston, Ont., died January 2, 1943. Col. Tamblyn was born in Callington, Cornwall, England, and obtained his early education in England. He joined the Health of Animals Branch in Canada in 1905 and was later district veterinary inspector in charge of Saskatchewan. He served in World War I. After serving for several years as Officer Administering the Canadian Army Veterinary Corps, he retired in 1936.

Albert C. Tillman (McK. V.C. '02), 72 years old, Earlville, Ill., died Jan. 5, 1943 at his home. He was born in Earlville March 28, 1870. He had practiced in the vicinity of his home town for 40 years, and at the time of his death was also mayor, in which position he had performed a fine service to the community. Dr. Tillman was a member of the Illinois Veterinary Medical Association and had been a member of the AVMA since 1907.

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Our sincere apologies to the many veterinarians we have had to disappoint because of our inability to supply their requirements of Cutter B-T-V.

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An' Related Topics

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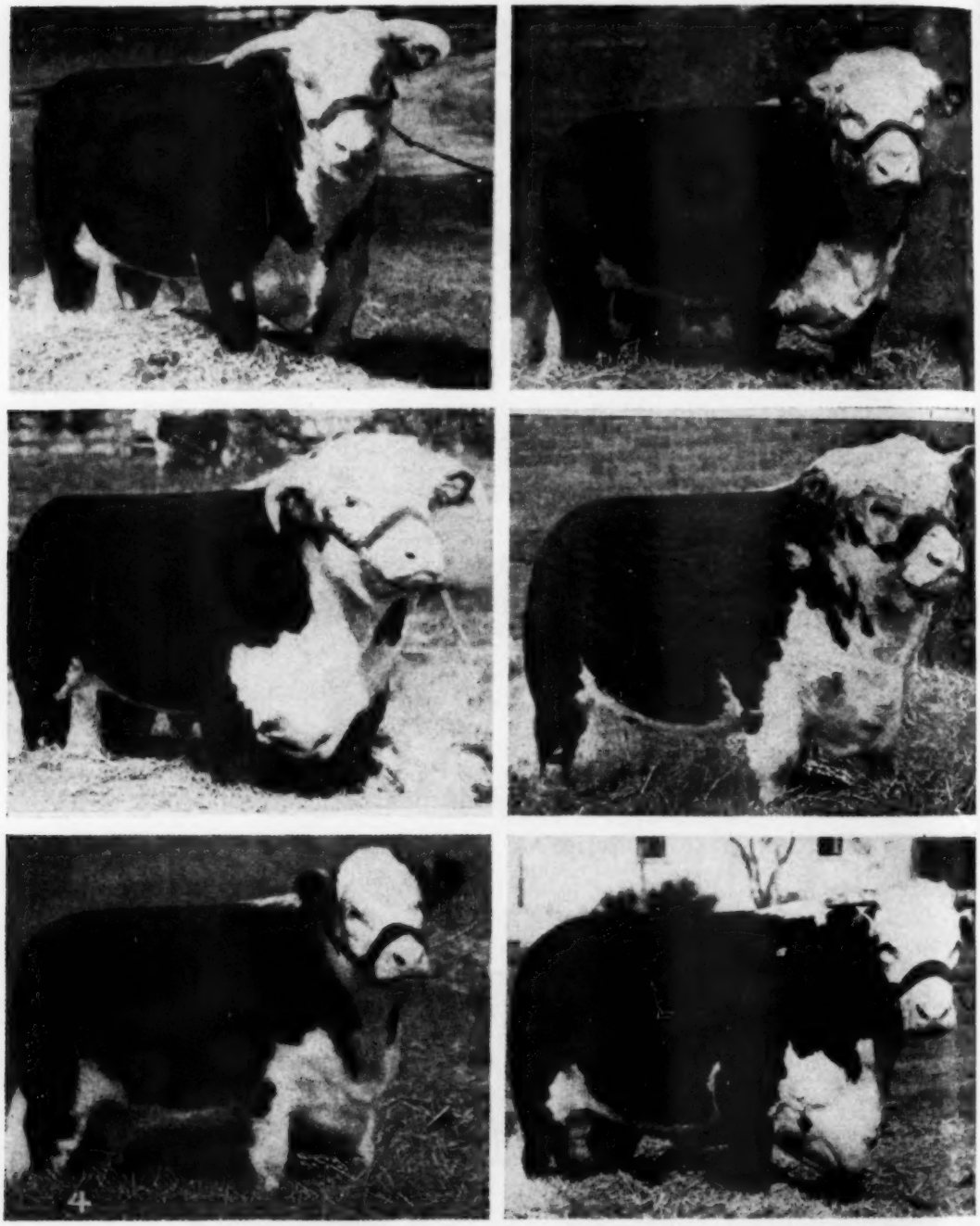
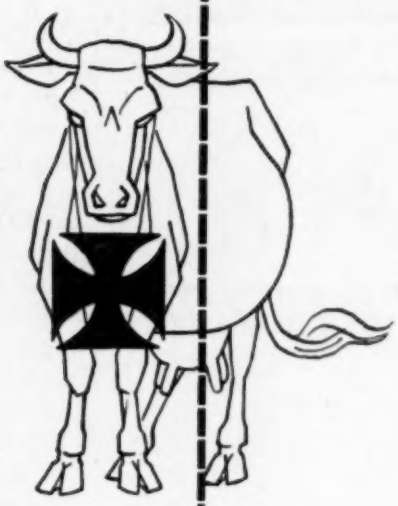


They reign where the ticks once ruled, thanks to the researches and police work of the United States Bureau of Animal Industry—to Salmon, Smith, Curtice, and Kilbourne.



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An' Related Topics

Anthropoidae Need Pediatrists

Comes a clipping from New York quoting a physician's wife, self-declared nurse maid for gorillas and chimpanzees, to the effect that the war in West Africa is exterminating these primates from the face of the earth and that another trouble in raising them in captivity is that veterinarians instead of physicians are called when they are ill. Her husband, a stomach specialist, "agrees that employing a veterinarian to treat a gorilla is as senseless as employing a veterinarian to treat an ailing child." "The idiotic part," adds our correspondent, "is that this woman is constantly consulting me when her apes are ill. Besides being full of mistakes, this newspaper article is pretty cheap."

The genie our correspondent overlooks in this blast is the newspaper reporter who has to write such things to get his stuff past the copy reader.

The Talismanic Carabao

In Toradjes of Central Celebes (Dutch West Indies) the value of a carabao (water buffalo) depends upon c e r t a i n whorls, horns and color in addition to the conformation. Certain kinds of whorls are said to bring the owner good fortune and others bad luck. The color is also regarded as important in establishing the price. Animals with glass eyes and black-flecked coat bring high prices, for they are supposed to bring good luck. Albinos are forbidden as food. The age is determined by measuring the horns with the fingers, hand and arm. [*Moh. Mansjoer, assistant veterinarian, Institute of Buitenzorg. An Interesting Peculiarity of Judging the Value of the Carabaos by Toradjes People of Central Celebes. Nederlansch Indische Bladen voor Diergeneeskunde, lii (Feb. 1940), pp. 21-28.*]

C. H.

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An' Related Topics

Scientists and Writers

Survival of the fittest, time-honored Darwinian doctrine, consecrated for more than a century in scientific literature is faulty grammar to H. G. Wells* famous historian and writer. To be exact, says Wells, the phrase should read *Survival of the fitter*. What do you think and why? Our vote is for Darwin.

**Outlines of History*, 3rd ed. p. 15.

The greatest of all history writers were the crawling creatures of prehistorical ages who inscribed indelible records into the substance of forming rocks. Will *our* records be as legible in the ages to come?

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Cincinnati, Ohio

An' Related Topics

"No Vets to Do the Work"

The Dakota Farmer, issue of August 5, says:

The American Veterinary Medical Association—a fine and useful organization—has recommended to the U.S.D.A., a plan to increase egg supplies available to the Allies. The association says that adult mortality in poultry has doubled since the last war; cut adult bird death losses by ten points and the birds saved will lay half the increase of eggs needed for 1942. However! The hub of the plan seems to be this: That upon the first sign of disease in a flock the owner is immediately to "obtain prompt veterinary diagnosis so that the outbreaks can be stopped before they make real headway." And that—in more than half of the Dakota communities—is just plain impossible today, because there are no vets to do the work.

The Association is sincerely thankful for this compliment and for the frank statement of fact concerning the scarcity of college-trained veterinarians in South Dakota, which is well known in the nation's veterinary circle.

The Association's recommendations on a plan to increase egg production was documented by the best minds in the field of poultry pathology. Experts from congested poultry centers from California to the eastern Seaboard and from the U. S. Bureau of Animal Industry weighed every word that went into them, and they were well aware of situations such as *The Dakota Farmer* points out. The answer primarily is that it does not pay to raise animals as gregarious as chickens where there is no access to veterinary service either in the form of a state diagnostic laboratory or two, or local veterinarians familiar with poultry-disease problems. Secondly, there is no state too poor to provide laboratory facilities for her people and a few expert animal doctors de-

IN CANKER
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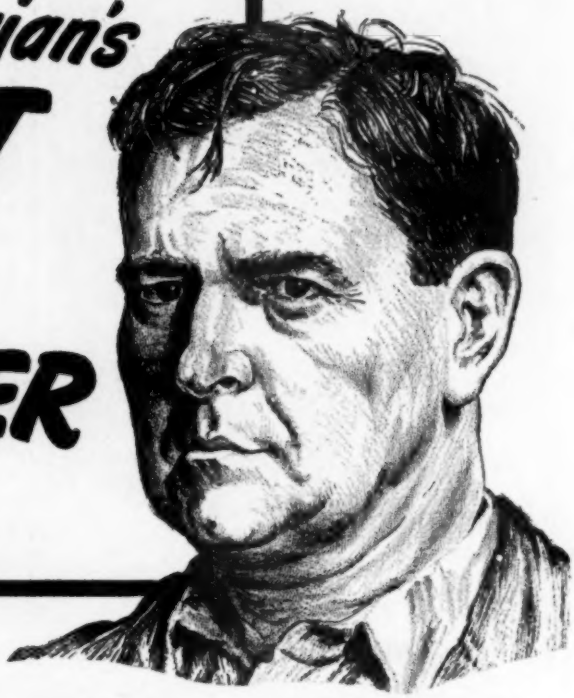
EAR MITES

VETERINARY *Auralgan*

Veterinary Division THE DOHO CHEMICAL CORPORATION NEW YORK - MONTREAL - LONDON

The veterinarian's CLIENT

Purina's CUSTOMER



THE livestock feeder is the veterinarian's client . . . Purina's customer. The veterinarian is pledged to use his trained skill in the prevention and cure of disease in his animals. Purina Territory Managers are earnest in their efforts to promote sound principles of sanitation, breeding and management. All these things go with Purina Chows to get results that make the livestock feeder a satisfied, prosperous customer . . . one who is able to pay his feed bill and his veterinarian's bill.

Purina's promotion of sound principles of feeding and Purina's manufacture of highest quality feeds have proven to be "good business" and a benefit to livestock production. Purina's 50 years of growth to its position of leadership in the feed manufacturing industry is built on the solid rock of *service* to the Purina customer.

The Purina Territory Manager sells and services Purina Chows and Purina Sanitation products. He knows how these products should be used and he is usually experienced in livestock problems. The Purina Territory Manager, in his work with feeders, does not in any way usurp the position or pretend the skill of the veterinarian. It is standard Purina practice to advise feeders with sick animals or poultry to "Call the veterinarian."

The purpose of this series of advertisements is to build the better acquaintance which leads to mutual respect and friendship between the veterinary profession and Purina Mills . . . between veterinarians and Purina Territory Managers, who may cooperatively better serve the livestock feeder in his fight to feed the world.

PURINA MILLS • ST. LOUIS, MISSOURI

. . . and that's how these puppies were born

THIS litter of healthy whelps may owe its existence to the aid of ***PERANDREN.*** This most powerful of the male sex hormones is making excellent therapeutic history in the treatment of selected cases of sexual impotence in small and large animals. One report cites tying within 48 hours after injection of ***PERANDREN**** with subsequent birth of healthy pups.

Too often one or more of the weaklings in a litter are lost within the first few hours after birth. ***CORAMINE,*** has proven of value in giving weaklings sufficient initial stimulation to save them. The therapeutic dosage is so markedly less than the toxic dose of ***CORAMINE**** that little fear need attend its use.

PERANDREN

THE MASCULINIZING HORMONE

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CIBA

Pharmaceutical Products, Inc.

SUMMIT, NEW JERSEY

ployed here and there, who earn their living partly from private practice and partly from the state. States owe these to their food-producing farmers and to their people. Failure to do so has been costly to states that have not kept pace with the modern utilization of veterinary medicine. South Dakota with her vast livestock industry has room for improvement in this respect. The proof will be found in comparing her livestock inventory with the budget appropriated by her legislature for animal-disease control. The American Veterinary Medical Association with 79 years of continuous effort in behalf of American farmers has always struck a sympathetic attitude toward them, but must confess that it has no patience with the programs of quackery or *laissez faire* attitudes advocated by the lawmakers who have yet to be impressed with the fact that the plenty enjoyed in this country is due largely to the suppression of farm-animal diseases. Only the stockmen of states which have not obeyed the rules of livestock sanitary science continue to suffer seriously from animal diseases. "There are no vets to do the work" is home grown.

Pediatrics and Geriatrics

Pediatrics (from *pias*—child—and *iatrikos*—treatment) and geriatrics (from *gerön*—old man—and *iatrikos*—treatment) became special branches of medical science in 1859 and 1909, respectively. But, writes Thewlis (*J.A.M.A.*, Nov. 7, 1942), it was not until 1896 that a text book on the diseases of infancy and childhood was written. The medical profession frowned upon the intrusion of such a study.

The word "geriatrics," treatment of the aged, was coined by Nascher, of New York, in 1909, and five years later he wrote a book on the subject, a second edition of which appeared in 1916.

Because there are 13 million persons past 60 in the United States and nine million past 65, with prospects that these numbers will increase, not to mention the replacement of personnel lost to the armed

Check the advantages of

DISTEMPEROID VIRUS

(Canine Distemper Vaccine - Ferret Origin - Green Method)

- ✓ Single-injection method.
- ✓ Produces rapid, solid immunity.
- ✓ Nonpathogenic for canines.
- ✓ Can safely be given to healthy pups 10 weeks old.
- ✓ Viability assured . . . has six months expiration date.
- ✓ No serum required.
- ✓ Distemperoid Virus is a nonpathogenic LIVE VIRUS . . . a LIVE VIRUS is essential to the production of lasting immunity.

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Supplied in: **Single-dose packages, 5-dose packages, 10-dose packages**

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Must be in good condition

AMERICAN VETERINARY MEDICAL ASSOCIATION, 600 S. Michigan Ave. CHICAGO

forces and decreasing birth rates, geriatrics has become significant in social and economic problems.

'Twon't Hurt to Know That

About 1,000,000,000 years ago there was no sign of life on earth. The *Azoic Age*—no life—it is called.

Then some 600,000,000 years later came the animalcules, green scum, jelly fish and the like. The period is named the *Proterozoic Age*—no living structures—then somewhere about 360,000,000 years ago, things livened up a bit by the coming of invertebrates, trilobites, the first thing with legs, and the sea scorpions. That was the *Early Paleozoic Age*—prevertebral, and a 100 million years later, or 260,000,000 years ago, came the fishes and amphibia—the *Late Paleozoic Age*—the swamps and the forest amid steam and fog. When another 100 million years elapsed, or 160,000,000 years ago, there came the snakes, the *Mesozoic Age*, which ushered in the flying fish, feathered birds and fur-clothed animals.

The interest of the veterinarian *per se* begins 40,000,000 years back with the coming of mammals, or the *Cainozoic Age*, the age in which we now live.

The important thing about this is the sequence, not the figures, for, according to confessions of the paleontologists, one has the right to multiply them by two or three or divide them by 10, and no critic will object.

What about Hominidae—man? When did he come along? H. G. Wells says 600,000 years ago or there about: source obscure, debatable, in other words, not known. Whether our family of mammals evolved from the ape, chimpanzee, or gorilla or sprang from some unknown anthropoid remains a secret of Nature.

Vague recorded history begins with the *Age of Agriculture*, 15,000 years ago, about 13,000 B. C.; let us say during the last phase (day) of Creation, and leave to the archaeologists the division of the rest of the billion years to suit their liking.

SPECIAL NOTICE!

VITALITY BRAND DOG FOOD

Has been granted the seal of approval

This means that Vitality Brand Dog Food (meal or cubes) has been tested on rats and dogs and the results of these biological feeding tests have been approved by the Joint Committee on Foods of the American Veterinary Medical and Animal Hospital Associations. This SEAL gives you the additional assurance of Vitality's fine mineral balance, complete vitamin fortification and all-around nutritional dependability.

RECOMMEND IT WITH CONFIDENCE

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136 Sale Tags

NATIONAL BAND & TAG CO., Dept. 6-479, Newport, Ky.

Free Folder for Veterinarians

. . . outlining the treatment of various infections with

SULFANILAMIDE SQUIBB

(Para-Amino-Benzene-Sulfonamide)

Also price list quoting veterinary hospital discount price.

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Single Bottle	$ 2.00
1-4 Dozen and One FREE . . .	5.00
1-2 Dozen and Two FREE . . .	8.00
1 Dozen and Four FREE .	15.00
2 Dozen and Four FREE . .	25.00

AGENTS

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Kentucky Serum Co. LOUISVILLE, KY

CARTER-LUFF CHEMICAL CO.

The Originators of Packaged Medicines for Veterinarians

HUDSON, N. Y.

An' Related Topics

Know Your History—or Else

Comes a holiday hangover chiding the JOURNAL for (quoting) "making a fuss over history, in space that might go to *problems of the present.*" (Italics supplied). The turgid atmosphere of a great war, like hot summers, cold winters, and phases of the moon, seems to cause strange mental dislocations—strange, because in the other branches of science, embarking for tours in the land of yesteryear is duty No. 1, not a "fuss over history," and nowhere is neglect thereof more accountable for inferiority than in our particular realm.

Drawing the curtain on the vistas left behind is the surest way to go on groping and growling to who-knows-where. Perhaps, we're still too plebeian to know that doting on *problems of the present* is a veritible barricade to our marching forward and is a sign of decay. Happily, the doting, once generalized, is getting more spotted.

Exclusive of the purely professional problems (which must bear the onus of the whole), readers of American veterinary literature must be noticing the pains capable authors now take to set down the history (= references) of the subjects treated. The pages of the past and those of the present make quite a contrast; they make up the tableau of what we are.

Articles and squibs on the professional, technical and secular past are given white space in the JOURNAL with due and careful premeditation. They are the vitamins for moral deficiency, drenches for making your job a science as well as an art, doses to keep your business a mental, in lieu of a menial, pursuit.

Yes, "There are more things in heaven and earth, my friend, than are dreamt of in your philosophy."

The Army is storing dehydrated food for several months under tropical conditions to test its keeping quality, nutritive value, and palatability.

The same basic formula that earned for Pard the confidence of the profession

Veterinarians have for years recommended Pard as a sound, nutritious diet for dogs. Now they can continue to do so with perfect confidence. For New Pard is as *rich* in the same health-building ingredients as before. Only the moisture has been removed by scientific dehydration* to permit new packaging that saves tin. To restore it, simply add water before serving.

You will welcome the economy of feeding New Pard. Because it provides the essential food elements, minerals, and vitamins needed for fine condition—no other food is necessary. 2 packages of New Pard go just as far as 3 cans did—and dogs like it every bit as well!

**An original Swift & Company process—patent applied for.*

Looks like fresh ground food when water is added! New Pard is scientifically dehydrated—not baked or dried at high cooking temperatures.

Convenient for dog owners! Add only water. No food supplements needed. No stirring, no mixing. Keeps without refrigeration.

An' Related Topics

Women and the War

—Courtesy of Science News Letter

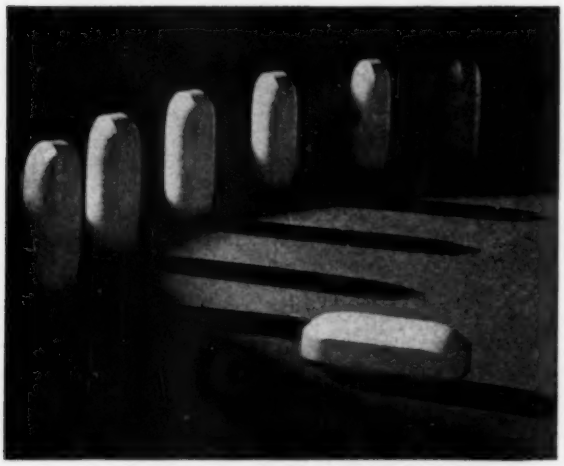
A War Plant Worker of whom there are thousands, and Schickelgruber thinks he has a chance!

Canine Distemper in 1830

White's Veterinary Dictionary, edition of 1830, describes canine distemper as "A specific catarrhal affection; the inflammation generally extending down the windpipe to the lungs, or down the gullet to the stomach and bowels; in some cases both of these passages are affected."

The definition *does* show that the author, as of that early date, *did* know something about the disease that veterinarians of 1943 still call *distemper*.

If much has been learned about the nature of this disease in the 112 years since James White of England wrote that definition, it can all be told by adding "virus" after "catarrhal" in the reconstructed sentence. In other words, the old pathologists who used their eyesight were not so dumb. Carré, Duncan, Laidlaw, Lockhart, Eichhorn, *et al.*, please notice.



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5 lb. cans	$1.57 per lb.
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Sulfathiazole Powder

1 lb. bottles	$6.00 per lb.

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Phenothiazine Bolus

Each PhenObole contains an accurately measured dose of the actual amount of phenothiazine needed for effective mass treatment of sheep, swine, horses and mules. There is no guesswork about sick animals receiving the required dosage.

PhenOboles disintegrate quickly. They are easy to administer by hand or forceps. Animals swallow them without difficulty.

12 ½ gram size (for lambs and hogs) in boxes of 25 and 100.

25 gram size (for sheep, horses and mules) in boxes of 25 and 100.

AMERICAN CHEMICAL COMPANY, INC.

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Effective treatment of

TAPEWORM INFESTATION

Vermifugal and purgative in action, NEMURAL is particularly effective in dogs and adult cats. Moreover, it acts quickly.

May be administered without a preliminary starvation.

Administration usually not followed by emesis.

Definite dosage: One 18 mg. tablet for each eight pounds of body weight.

Supplied in tablets of 18 mg., bottles of 100 and 500.
(Each tablet contains 3.13 mg. arsenic.)

NEMURAL

Reg. U. S. Pat. Off. & Canada
Brand of DROCARBIL

Literature and detailed information supplied on request.

Winthrop CHEMICAL COMPANY, INC.
Pharmaceuticals of merit for the veterinarian
NEW YORK, N. Y. - WINDSOR, ONT.

An' Related Topics

Egg-a-Torial*

Through the Christian kindness of the Nazi régime, every adult of France is allowed one hen's egg per month on his ration book. The benevolence figures out to 1/30 of an egg per diem, or a whole dozen per annum. And, will the pro-Nazi please notice: If the said adult goes to the Nazi-run black market, he can get an egg for a couple a' dollars, so help me God.

*Apology to the *Poultry Tribune*.

Now comes the radio commentator who has discovered that food, clothing, shelter, and transportation are wartime necessities. We've been suspecting that very thing, but are none the less thankful for being reminded that folks *do* have to have food and clothes and roofs and a way to move things.

Davis and Geck Awarded Army-Navy E

Davis and Geck, Inc., Brooklyn, who have specialized in the manufacture of sterile surgical sutures for more than a third of a century, were presented the Army-Navy E award on January 6, 1943. The presentation was made by Brig. Gen. Fred W. Rankin, chief consultant in surgery, Surgeon General's Office, U. S. Army, and president of the American Medical Association.

Cellophane was first made by a Swiss chemist over 50 years ago but machinery for its production in commercial amounts was not invented until 1912. The first two syllables of the word are from *cellulose*, and *phane* is taken from the Greek word *phaneros* meaning transparent.

In the Spring...

Combat bloat and colic with ADCA tablets

When stock goes out to grass in early Spring, bloat and colic start their biggest season.

Armour's ADCA Tablets are indicated in the treatment of these conditions, because these easily-administered tablets check gas formation and fermentation promptly.

ADCA Tablets provide a balanced combination of four effective anti-ferment and carminative agents.

They are available from most Armour Branch Houses and Creameries, and from:

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Nelson Laboratories
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Owl Drug Store
Central National Tower
Battle Creek, Mich.

Dr. J. C. Schoenlaub
Memphis Vet. Supply Co.
85 S. Front Street
Memphis, Tenn.

Dr. Robert D. Wall
910—28th Street
Des Moines, Iowa

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Indianapolis, Ind.

Dr. J. J. Arnold
Veterinary Products Co.
New Castle, Ind.

ARMOUR AND COMPANY
Veterinary Division • Kansas City, Kansas

Products of Dependability . . . Prepared for the Veterinarian

BUY
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FOR VICTORY

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Buy **NATIONAL PRODUCTS**
for a reliable adjunct to a
successful veterinary practice.

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THE NATIONAL LABORATORIES CORPORATION
KANSAS CITY, KANSAS

An' Related Topics

Something to Be Recognized

While looking through the AVMA member files, it was noted that one doctor had six degrees from six different colleges. This doctor happens to be Dr. Joab P. Foster of Minneapolis, Minn.

The six colleges and the degrees Dr. Foster earned are:

Huron College	B.Sc.	1907
Coe College	M.S.	1914
Ontario Vet. College	V.S.	1900
McKillip Vet. College	M.D.V.	1908
University of Toronto	B.V.Sc.	1914
University of Minnesota	M.Sc.	1920

Dr. Foster was born at Bangor, Maine, in 1871, has been a member of the Association since 1908, and was for many years chairman of the committee on history.

Discover for yourself why more than 7,000 members say with quiet pride, "I belong to the AVMA," the guardian of the veterinarians' status.

Concerning Your Importance, My Friend

Picture yourself as an ultramicroscopic speck (electronic inc.) perched on a one-inch marble (the earth) hanging 1,000 feet from a nine-foot globe (the sun), take a peep at a few balls (the planets) suspended, here and there, about the surrounding space 1,500 to 30,000 feet away, note that there is nothing beyond for 40,000 miles (the nearest star), then strut, if you can, about your importance—about just how much the universe will lose when you shuffle off. One man's not a helova lot, izzy?

John Public seems to be more excited over tires and gasoline for private use than over the war *per se*. Fighting for these is more popular than fighting the Jap's, yet in 1940, piling up a store of raw rubber for the coming emergency, was called crazy.

DIFCO

Dehydrated Meat Products for Preparation of Infusion Culture Media

Bacto-Beet Bacto-Liver Bacto-Veal
Bacto-Beef Heart for Infusions

These dehydrated meats are prepared especially for use in making infusion culture media. They are uniform and homogenous, having been prepared from large quantities of carefully selected lean meat, retaining all the nutritive and growth stimulating properties of the fresh tissues.

Difco Dehydrated Meats are stable, uniform, and convenient to use in laboratories preparing large or small quantities of culture media.

Specify "DIFCO"
THE TRADE NAME OF THE PIONEERS
In the Research and Development of Bacto-Peptone and Dehydrated Culture Media

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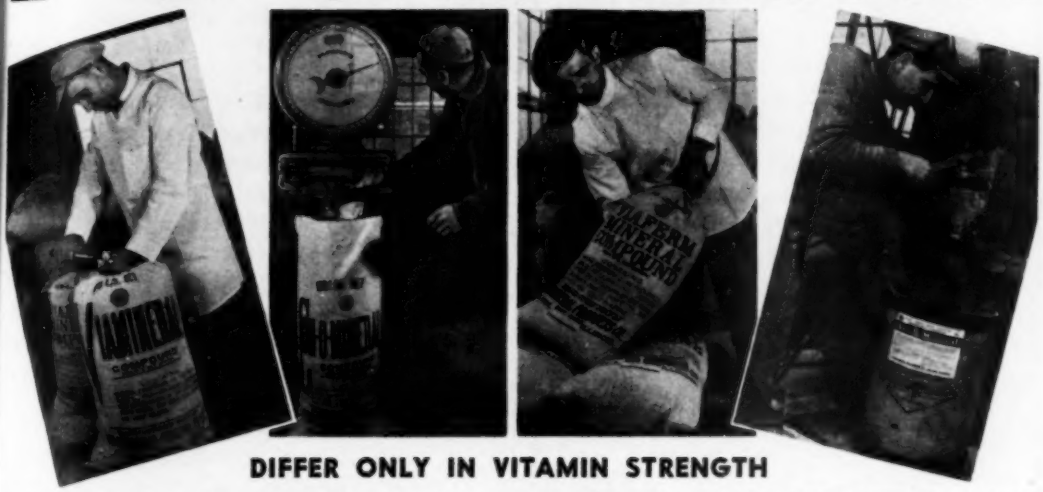

DIFFER ONLY IN VITAMIN STRENGTH

VIAMINERAL — generally used in "bolstering" feeds of dairy cattle, horses, sheep.

CON-O-MINERAL—aids in correcting bone deficiencies in swine and poultry, and other livestock.

VIAFERM — Extensively used; rapidly adds weight, finish to market stock, especially swine.

VIA-D-MINERAL — 64,000 USP units vitamin D per pound—produces rapid results.

All 4 Contain Calcium, Phosphorus, Iodine, Vitamins

Veterinarians can best advise their clients as to which VITAMINERAL PRODUCT they need for dairy, beef cattle, calf, horse, sheep, lamb, swine, pig and poultry feeding. Our VPC Feed Formula Book should be of value. Write for your FREE copy today.

1. Office . . . VITAMINERAL PRODUCTS started here by Dr. Peters and Paul S. Casey, 25 years ago.
2. Main mixing plant.
3. New mixing mill (1942) made necessary by Veterinary support.
4. Inside new mixing mill. Finished stock ready for shipment.

Write for literature on Viamineral, Con-o-mineral, Viaferm, Via-D-Mineral

VITAMINERAL PRODUCTS CO.

PEORIA *(Pioneers in Calcium and Phosphorus Feeding, Est. 1920)* **ILLINOIS**

IT'S AN ASSET . . . .

To have a simplified, accurate, perfect bookkeeping system like HISTACOUNT. HISTACOUNT gives you at a glance the entire history of every account . . . and it is so easy you hardly know you are keeping books . . . but there are the figures when you want to refer to them. Ask for free details.

Professional Printing Co., Inc.
America's Largest Printers to the Professions
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School of Veterinary Medicine

PHILADELPHIA

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Offers a complete course in veterinary medicine extending over four sessions, each beginning the fourth Monday in September and ending the second Wednesday in June. Clinics and equipment unexcelled.

Graduate Courses in Pathology and Bacteriology (including immunology) extending through one session.

For Catalogue and further information, address

GEORGE ALEXANDER DICK,
Dean, Veterinary Faculty

An' Related Topics

American Food Flowing Abroad

On Dec. 10, 1942, the Department of Agriculture announced that it had laid down at shipside 645 million pounds of food for the Allied Nations. This was 93 million pounds more than was shipped the preceding month (October). The delivery of dried eggs was nearly 15 million pounds and of shell eggs 44 million dozen. The following table, to which fruits, vegetables, nuts, cereal grains, oils, fats, and lard should be added, gives an insight into agricultural participation in the war effort of the United Nations:

Food Deliveries for United Nations
(Apr. 1941-Oct. 1942)

Commodity	October 1942 (Pounds)	Cumulative (Pounds)
Dairy and Egg Products		
Butter	5,035,520	8,444,117
Cheese	38,389,120	337,721,994
Eggs, Dried	14,692,160	132,795,184
Eggs, Frozen	.....	57,357,360
Eggs, Shell	.....	39,896,415
Milk, Dry Skim	17,838,880	133,715,100
Milk, Evaporated	11,782,400	747,201,295
Milk, Condensed	.....	975,816
Milk, Dry Whole	592,080	2,557,677
Milk Powder Mixture	.....	76,020
Total	88,330,160	1,460,740,978
Meat, Fish & Fowl		
Army Ration	68,320	8,593,776
Beef, Dried	.....	10,994
Beef Suet	57,120	131,892
Fish, Canned	23,336,902	202,580,363
Hog Casings	654,080	6,720,089
India Mess Beef	71,680	246,680
Meat, Canned Pork	68,882,336	665,141,793
Meat, Cured Pork	19,360,320	408,930,088
Ox Bungs	11,200	542,064
Poultry, Canned	176,960	6,521,148
Pork Loin	3,875,200	58,792,517
Total	116,494,118	1,358,211,404

The figures are published to point out where the veterinary service must labor in fulfilling its duty to the war effort, not in the spirit of boasting about American resources. Our enemies are, however, welcome to any comfort they can obtain from them.

HORSES are ESSENTIAL

to our

WAR EFFORT

A widespread outbreak of **Equine Encephalomyelitis** in 1943 would be a serious National Calamity, because it could result in such a severe food shortage that our war effort would be disrupted.

It is the obligation of veterinarians and all others concerned to avoid the possibility of such a calamity by using every effort to see that the greatest possible number of horses receive preseasonal injections of

Encephalomyelitis Vaccine

(chick embryo origin)

It has been thoroughly established that this procedure is almost 100% effective as a preventive. The duration of immunity being ten or more months, early immunization, before the rush of other work, is practical and desirable.

AS AIDS

in Stimulating early and extensive immunization we are engaging in a widespread publicity campaign through farm papers and magazines. This campaign emphasizes the necessity for immunization under war conditions, and points out that the work must be done by veterinarians for best results.

We also have cards suitable for veterinarians to distribute to horse owners. These briefly emphasize the increased importance of this work. Cards will be furnished free upon request.

Our 1943 Encephalomyelitis Vaccine

is now ready, and adequate supplies are available.

ALL VACCINE IN OUR STOCK IS REALLY FRESH—
WE DO NOT PRODUCE VACCINE FROM FROZEN EMBRYO STOCK.

SHE LOCKHART, INC.

"Producers of Better Biologicals
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In Canada—Canada Representatives, Ltd. — 193-195 Spadina Avenue, Toronto, Ontario

MEMBER Veterinary Exhibitors Ass'n

International News Photo

Two doses of Canine Distemper Tissue Vaccine followed by inoculation with liquid virus. For dogs up to two years of age.

Full stocks available at all Jen-Sal Depots

★

Now the official method of distemper prophylaxis for "Wags" of the Corps K-9, U. S. Army

1 Complete Canine Distemper Prophylactic Treatment (as illustrated).
Code: DISCO $2.00
Pkg. of 6-5 cc. $4.50
Liquid Blood Virus, per pkg. $0.50

Less discounts of 10 and 2 per cent

JEN-SAL *"All-In-One"* CANINE DISTEMPER PROPHYLACTIC TREATMENT

brings you the same method used by the U. S. Army to protect its valuable enlisted dogs.

Each package contains two 5 c.c. doses of vaccine prepared from formolized distemper virus of canine tissue origin together with a single dose of Canine Distemper Virus (blood origin) produced according to a method based on extensive research studies in our own laboratories.

Jen-Sal Canine Distemper Prophylactic Treatment combines attractive packaging, careful standardization and high antigenic efficiency.

JENSEN-SALSBERY LABORATORIES, Inc.
KANSAS CITY, MISSOURI

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★